INSTALLATION / OPERATION / MAINTENANCE

Applies to:

Model VSUS & VSLUS
120V 60Hz
Gas-Fired, Tubular, Radiant, Low-Intensity Infrared Heater



OWNERS MANUAL

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

AMBIRAD
HEATING AND VENTILATION SOLUTIONS

Part # 700110

Introduction.

Welcome to the new range of vacuum infra-red heaters. Local regulations may vary and it is the installer's responsibility to ensure that such regulations are satisfied.

All installation, assembly, commissioning and service procedures must be carried out by suitably qualified competent persons and conform with local building codes, or in the absence of local codes, with the National Fuel Gas Code ANSI Z223.1/NFPA 54.

When assembling, installing, commissioning and servicing is undertaken on radiant tube heaters specified in these instructions, due care and attention is required to ensure that working at height regulations are adhered to.

***PLEASE READ** this document prior to installation to familiarize yourself with the components and tools you require at the various stages of assembly.*

All dimensions shown are in inches unless otherwise stated.

The manufacturer reserves the right to alter specifications without prior notice.

Document Index.

1. Installation Requirements.

1.1 Health and Safety

A. Heaters are intended for heating non-residential indoor spaces and should only be installed where flammable gases or vapors are not generally present.

B. Heaters may be suspended either horizontal or at an angle, or may be wall mounted. See section 1.5 for clearance dimensions.

C. The installation must conform with local building codes or, in the absence of local codes, with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54* or the *Natural Gas and Propane Installation Code, CSA B149.1.*

D. The unit shall be electrically grounded in accordance with National Electric Code ANSI/NFPA 70 and Canadian Electrical Code CSA C22.1.

E. The heater may be installed in aircraft hangars in accordance with the Standard for *Aircraft Hangars, ANSI/NFPA 409,* and in automotive garages in accordance with the Standard for *Parking Structures, ANSI/NFPA 88A*, or the Standard for *Repair Garages, ANSI/NFPA 88B,*, or the *Canadian Natural Gas and Propane Installation Code, CSA B149.1*, and are so marked.
Ensure that minimum clearances will be maintained to vehicles parked below the heater.

F. The standard heaters are approved for installations between 0 - 2000ft (0 - 610m) for the US and 0 - 4500 ft (1370m) for Canada. Conversion kits are available on installations above these heights in the USA.

1.2 Heater Suspension

Attachment to the heater support lugs should be made by a D shackle. The hanging attachments to overhead steelwork etc. must be purpose made to good sound engineering practice or of a proprietary type supplied by others.
They must be adequately fixed and designed to carry the whole weight of the heater. In the event of suitable roof steelwork being unavailable, additional steelwork should be fitted to enable vertical hangers to be used for suspending the heaters.
These methods are illustrated in Figure 1. If there are any doubts as to the strength or suitability of roof steelwork to which heaters are suspended, please refer to a Consultant, Architect, structural engineer, or owner of the building.

It is recommended that the heater is raised to its final position once the assembly of the tube/bracket/reflector has been completed. Longer tube assemblies may be raised in more than one sub-assembly with final tube connections made in the air.

1.3 Wall Mounting

These radiant tube heaters can be wall mounted using the appropriate bracket.

When using the wall mounting brackets the heater must be inclined at an angle between 35° and 55°, when side wall (perimeter) reflectors are not used.

WARNING:

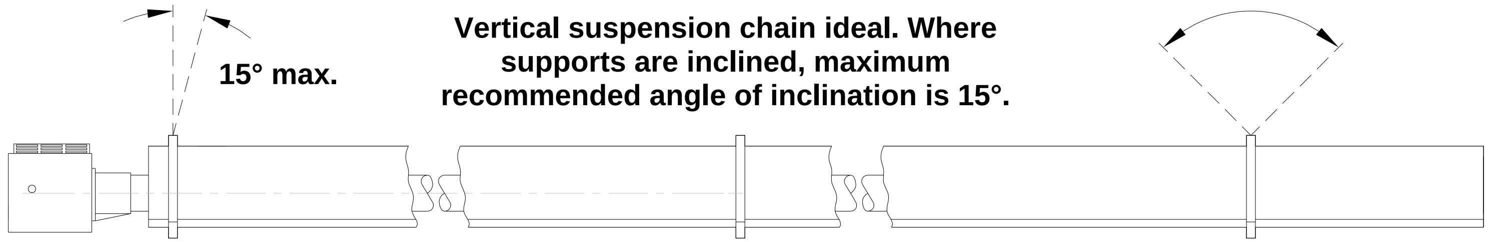
If not installed, operated and maintained in accordance with the manufacturer's instructions, this product could expose you to substances in fuel, or from fuel combustion, which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Figure 1. Recommended Methods of Heater Suspension.

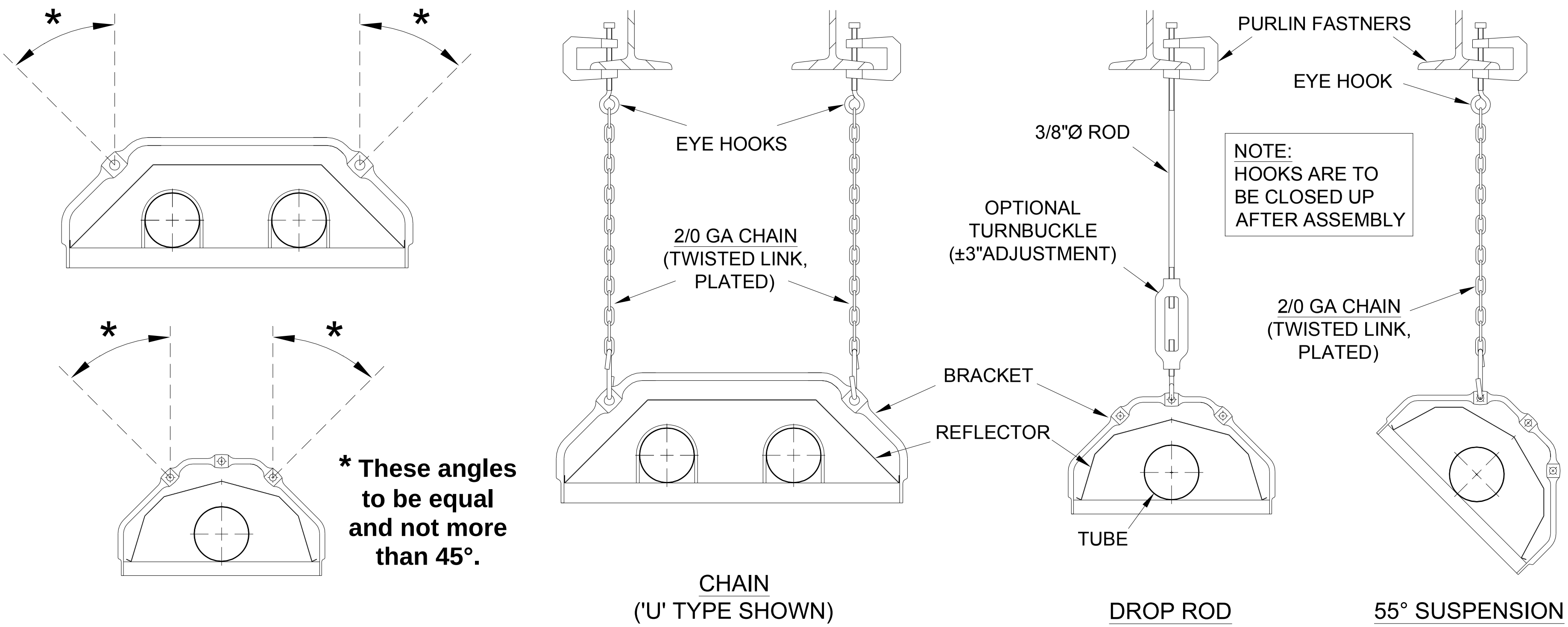
It is recommended that on linear variants, at least the first suspension bracket should be supported by 2 chains to prevent the heater tilting.

Vertical suspension chain ideal. Where supports are inclined, maximum recommended angle of inclination is 15°.

Where chain supports have an angle of inclination greater than 15° an equal and opposite support is recommended.



ON U TUBE VARIANTS THE HEATER SHOULD SLOPE DOWNWARDS TOWARDS THE RETURN BEND AND ON LINEAR VARIANTS SHOULD SLOPE DOWNWARDS TOWARDS BURNER BY APPROX. ½" FOR BOTH HORIZONTAL AND WALL MOUNTED INSTALLATIONS.



1.4 Clearance to Combustibles.

Minimum clearance to combustibles are shown in Figures 2a/2b. Use in conjunction with Table 1 below.

IMPORTANT:
The stated clearance to combustibles represents a surface temperature of 90°F (50°C) above room temperature. Building material with a low heat tolerance (such as plastics, vinyl siding, canvas, tri-ply, etc.) may be subject to degradation at lower temperatures.
It is the installer's responsibility to assure that adjacent materials are not subject to such degradation.

Table 1

	Clearance to Combustibles, inches (cm)												
Model	**A**		**B**	**B1**		**C1**	**C2**		**C3**	**D****	**D1**	**D2**	**E**
	UT	**SL**		**UT**	**SL**		**UT**	**SL**	**SL**	**UT**	**SL**	**SL**	
40	63 (160)	49 (125)	25 (64)	48 (122)	41 (105)	10(26) / 16(41)*	10(26) / 16(41)*	8 (21)	10 (26)	48(122) / 14(36)**	18 (46)	20 (51)	10 (26)
60	66 (168)	66 (168)	30 (77)	48 (122)	41 (105)	10(26) / 16(41)*	10(26) / 16(41)*	8 (21)	10 (26)	48(122) / 14(36)**	18 (46)	20 (51)	10 (26)
80	72 (183)	72 (183)	30 (77)	48 (122)	41 (105)	10(26) / 16(41)*	10(26) / 16(41)*	8 (21)	10 (26)	48(122) / 14(36)**	18 (46)	20 (51)	10 (26)
100	72 (183)	72 (183)	32 (82)	48 (122)	41 (105)	10(26) / 16(41)*	10(26) / 16(41)*	8 (21)	10 (26)	48(122) / 20(51)**	18 (46)	20 (51)	10 (26)
125	74 (188)	74 (188)	39 (99)	48 (122)	47 (120)	10(26) / 16(41)*	10(26) / 16(41)*	8 (21)	10 (26)	48(122) / 20(51)**	18 (46)	20 (51)	10 (26)
150	78 (199)	86 (219)	39 (99)	48 (122)	48 (122)	10(26) / 17(44)*	10(26) / 17(44)*	8 (21)	10 (26)	48(122) / 28(72)**	18 (46)	28 (72)	10 (26)
170	86 (219)	86 (219)	48 (122)	48 (122)	48 (122)	10(26) / 17(44)*	10(26) / 17(44)*	11 (28)	10 (26)	48(122) / 40(102)**	18 (46)	28 (72)	10 (26)
200	86 (219)	86 (219)	48 (122)	48 (122)	48 (122)	10(26) / 17(44)*	10(26) / 17(44)*	11 (28)	10 (26)	48(122) / 40(102)**	18 (46)	28 (72)	10 (26)

* unvented ** with end caps

WARNING:

Minimum clearance from the heater must be maintained from vehicles parked below heater. In all situations, clearances to combustibles must be maintained. Signs should be posted in storage areas to specify maximum stacking height to maintain required clearance to combustibles. Such signs must either be posted adjacent to the heater thermostats or in the absence of such thermostats in a conspicuous location. Refer to mounting clearance tables.

Figure 2a Clearance to Combustibles (U-Tube Variants).

The minimum clearances to combustible materials are given in the tables below. These minimum distances MUST be adhered to at all times. Adequate clearance MUST be provided around air openings into the combustion chamber and there MUST be suitable clearance for accessibility and for combustion / ventilating air supplies.

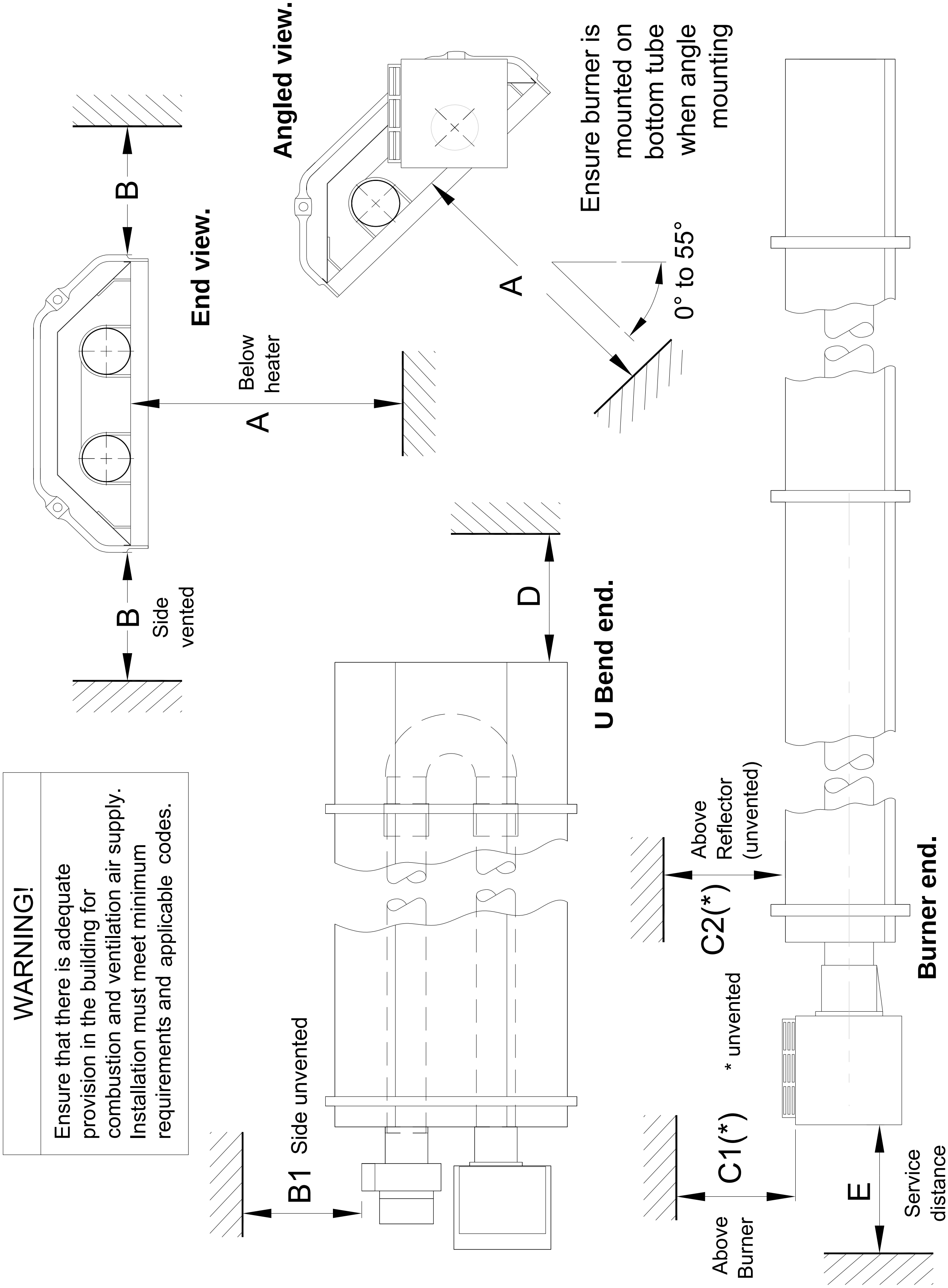
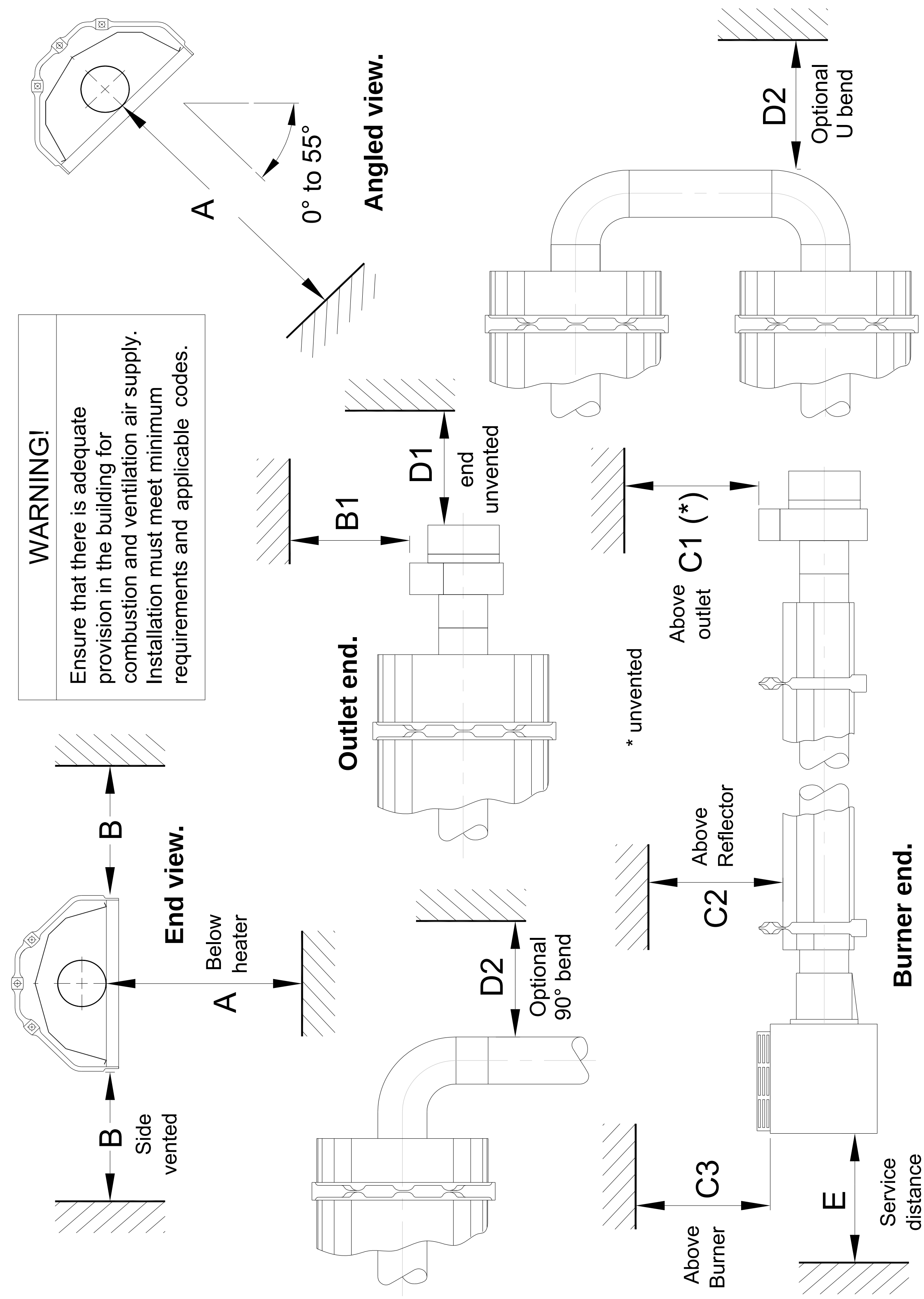


Figure 2b Clearance to Combustibles (Linear Tube Variants).

The minimum clearances to combustible materials are given in the tables below. These minimum distances MUST be adhered to at all times. Adequate clearance MUST be provided around air openings into the combustion chamber and there MUST be suitable clearance for accessibility and for combustion / ventilating air supplies.



1.5 Gas Connection and Supply

WARNING: Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

The gas connection to the heater is ½" N.P.T internal thread.

Injector sizes and manifold pressure for the burners are shown in Section 1.9. The gas supply piping and connections must be installed so that the recommended pressure stated is achieved.

A gas shut off valve and union should be fitted in the gas supply line close to the heater and a ⅛" N.P.T plugged tapping, accessible for test gauge connection, provided immediately upstream of the appliance gas inlet.

It is essential to provide some flexibility in the final gas connection by use of an approved flexible gas connector. See Fig 4.

Take care when making a gas connection to the heater not to apply excessive turning force to the internal controls.

Care must be taken to observe the minimum pipe bend diameter (minimum 10" - 250mm, maximum 14" - 350mm) & pipe expansion distance (minimum 1⅛" - 28mm, maximum 3¾") - 95mm.

The correct installation as shown will allow for approx 4" of movement due to expansion.

Figure 3. Correct orientation of Ball Valve

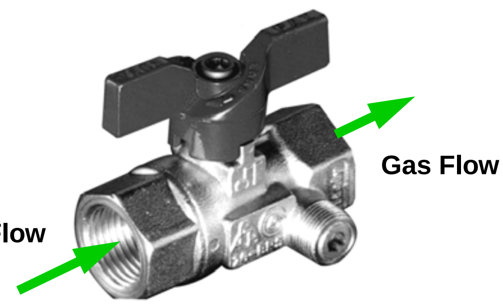
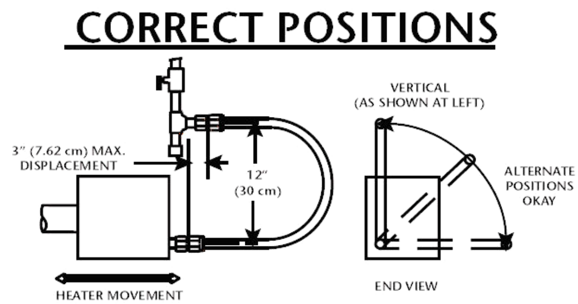
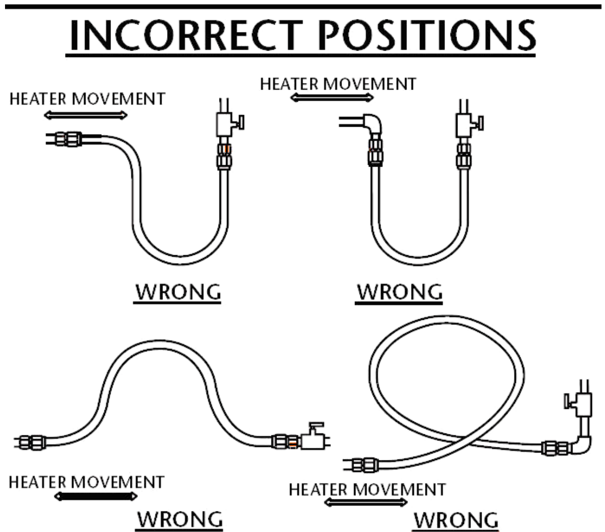


Figure 4. Correct Installation of Flexible Gas Connection





WARNING: FIRE OR EXPLOSION HAZARD - Expansion of the radiant pipe occurs with each firing cycle causing the burner to move with respect to the gas line. This can result in a gas leak producing an unsafe condition. It is therefore essential to provide some flexibility in the final gas line connection by use of an approved armoured flexible connector or stainless steel expansion loop as shown in the drawings.

Table 3 Gas Supply Pressures

Gas Type	Natural Gas	LP/Propane Gas
Required Gas Pressure (in W.C) 60,000 to 150,000 btu	5.0	11.0
Required Gas Pressure (in W.C) 170,000 to 200,000 btu	7.0	11.0
Max Supply Pressure (in W.C)	14.0	14.0
Gas Supply	Connection ½" N.P.T thread	

1.6 Electrical Connections

WARNING: Before making electrical connections, switch OFF the main electrical disconnect. There may be more than one disconnect switch. Lock out and tag switch with a suitable warning label. Electrical shock can cause personal injury or death.

This appliance must be electrically grounded

Supply 120V 60Hz single phase.
Standard heater 0.16HP.
Current rating 1.2 amp max (inductive).
Fuse: external 3 amp.

Important: All electrical work should be done by a qualified electrician in strict accordance with the National Electrical Code ANSI/NFPA 70 or Canadian Codes CSA C22.1.

The electrical supply to the heater is by three wires: live, neutral and ground connections.
Install in accordance with all state & local codes.

Where alternative manufacturers controls are used, please refer to their instructions for siting and installation details.

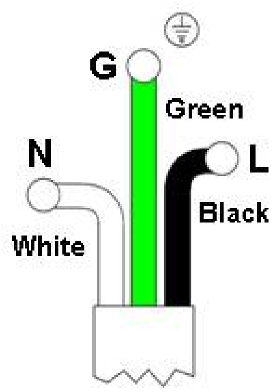


Figure 5.a Typical U-Tube Range Wiring Connections

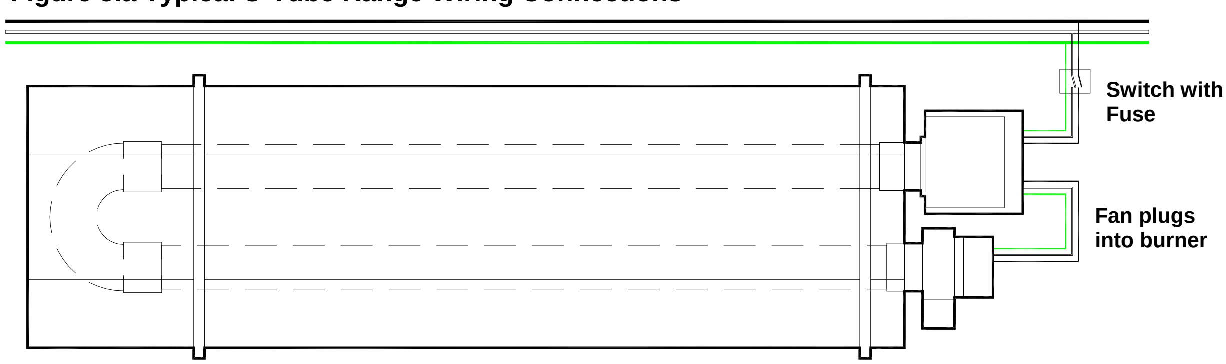


Figure 5.b Typical Linear Range Wiring Connections

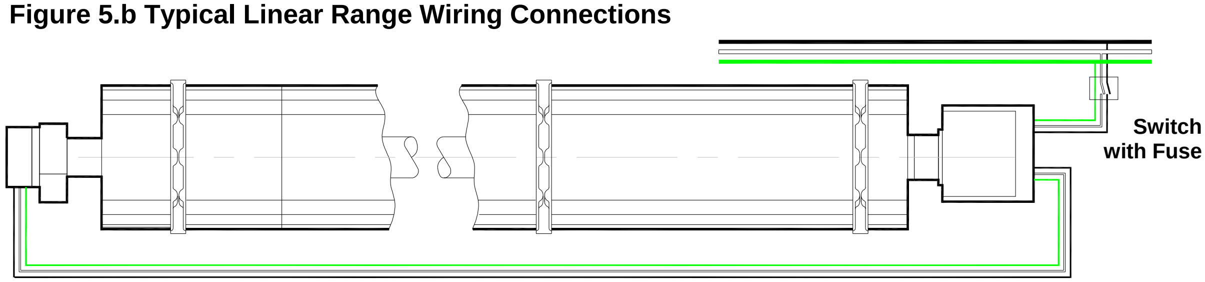


Figure 5c. Single and Multiple Heater Installations 120V Control

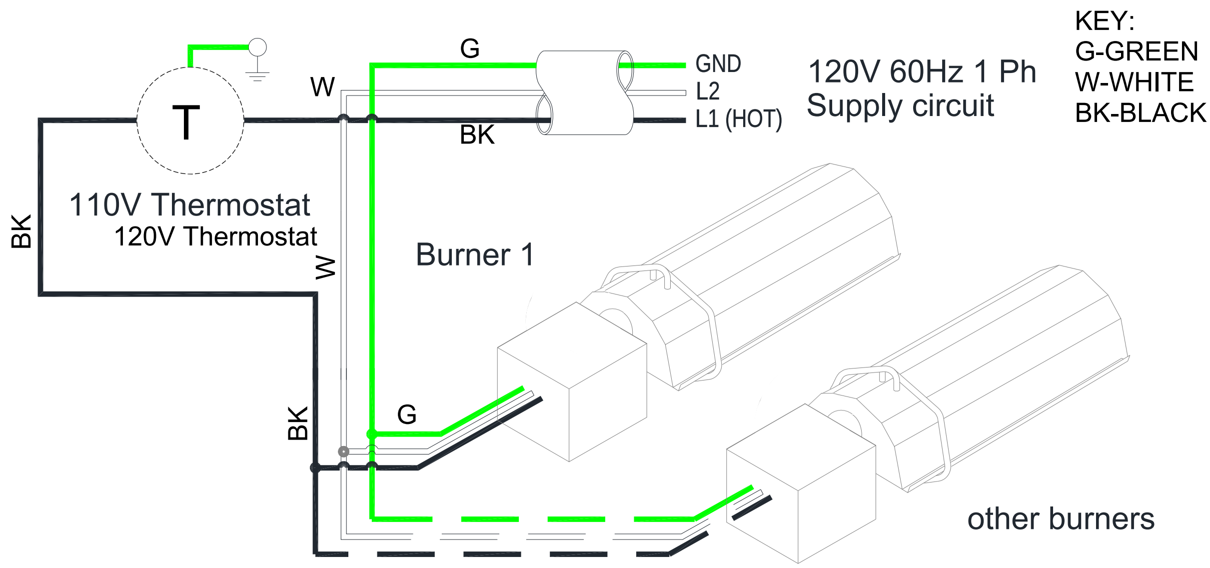


Figure 5d. Single Heater Installations 24V Control

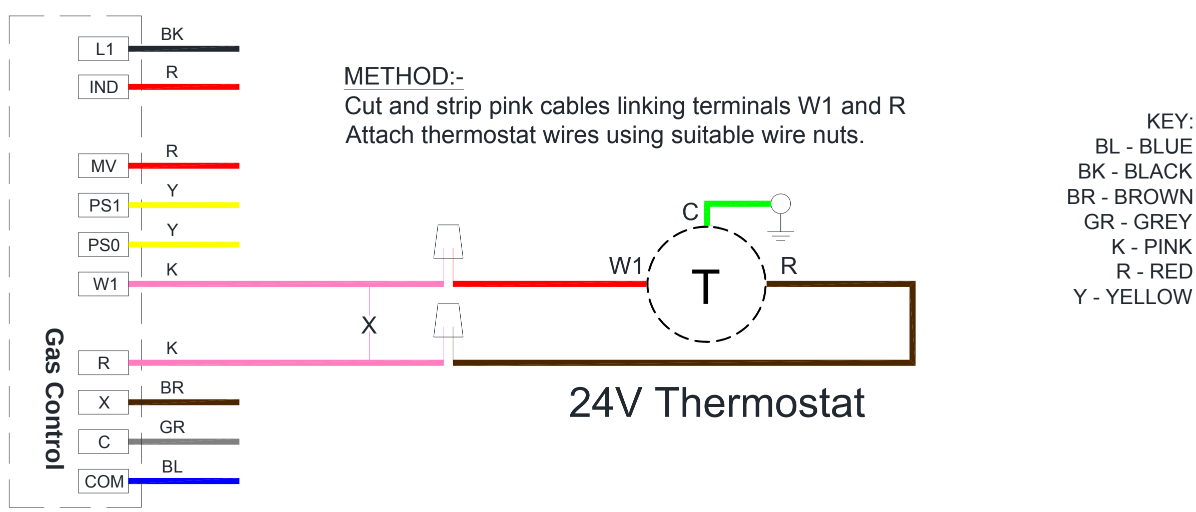
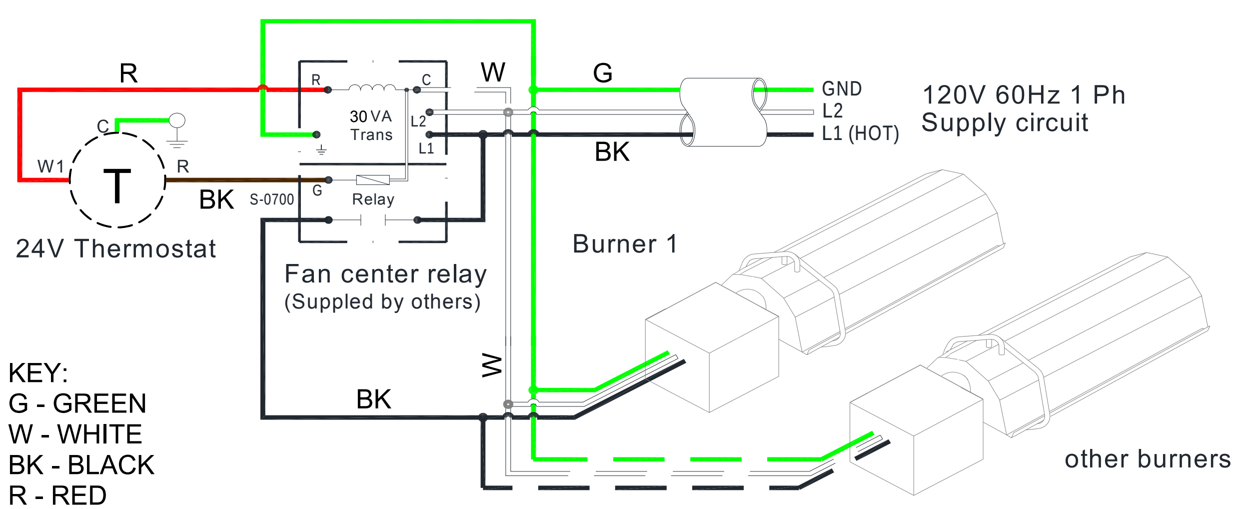
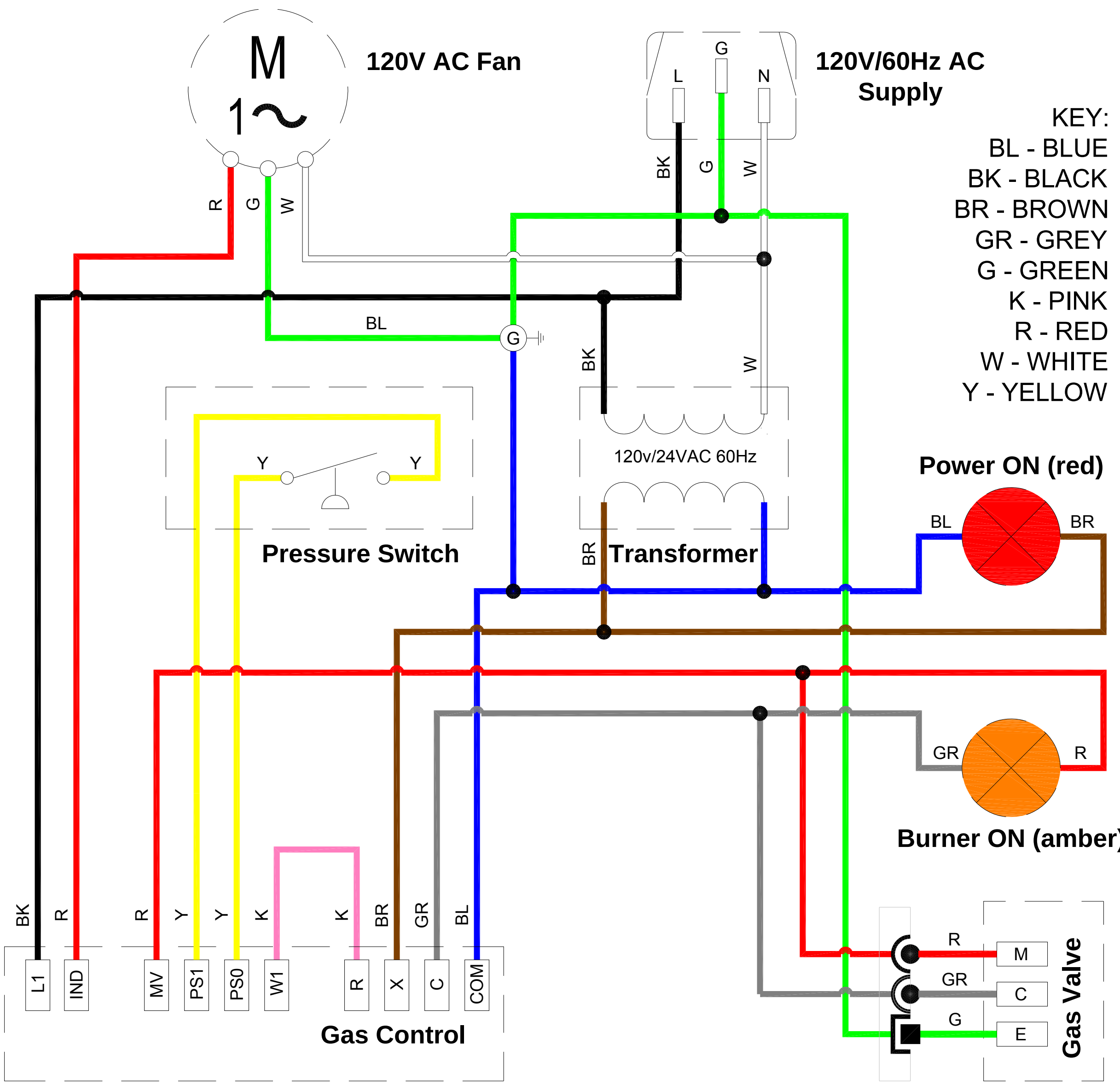


Figure 5e. Multiple Heater Installations 24V Control



If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 220°

Figure 5d. Internal burner wiring diagram



NOTES:-

Power On light is permanently illuminated when 120V / 60 Hz AC external supply is connected to burner.

Additional wiring is required to install an optional extra thermostat and / or time clock.

If no thermostat is required then a jumper is fitted between terminals R and W1. In this configuration the burner will continuously fire until the 120V power supply is disconnected.

Wire specification:- 18 AWG (1.0mm²), Tri-rated, 105°C

1.7 Ventilation Requirements

1.7.1 Unvented units

Heaters may be installed without a vent providing the governing building codes are met and consideration is given to possibilities of condensation on cold surfaces.

Installation shall meet the following requirements when unvented:

- Natural or mechanical means shall be provided to supply and exhaust at least 4 CFM per 1000 BTU per hour input of installed heaters.
- Combustion gases shall not impinge on combustible materials.

1.7.2 Vertical venting

The heater can be installed with a vertical vent.

All vent piping should be adequately supported from the building structure and terminated with an approved terminal. **The maximum recommended vent length is 25ft (7.6m) with a maximum of two elbows**. All connections should be properly sealed. Refer fig 6a.

1.7.3 Horizontal venting

Individual units can be vented horizontally through side walls. Recommended terminals are Part Numbers V0700 for 4” and V0800 for 6”.

Distances from adjacent public walkways, adjacent buildings, opening windows and building openings, consistent with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54,* or the *Natural Gas and Propane Installation Code, CSA B149.1.*

Maximum length of vent is 25ft (7.6m) with two 90° elbows.

Runs of 12ft (3.6m) or shorter can use 4” (101mm) dia vent. Runs over 12ft (3.6m) should use 6” (152mm) vent pipe.

Any portion of vent that passes through a combustible wall must be insulated, or use an approved insulating thimble.

Standard vent terminals must extend at least 6” (152mm) from the wall and at least 24” (609mm) from any combustible overhang. This protects the building material from degradation by the vent gases.
Vent joints should be sealed and secured according to the vent manufacturers instructions. Should condensation occur the vent should be shortened or insulated.

The terminal should be at least 3ft (0.91m) away from any air intake to the building.

If the heater is equipped with ducted combustion air, the vent terminal must be at least 3ft (0.91m) away from the air inlet and located higher than the inlet.

The vent terminal must be installed at a suitable height above the ground to prevent blockage by snow.

1.8 Fresh Air Intake

Whenever the heater is installed in locations where airborne dust or other pollutants are present, a fresh air supply should be ducted to the burner.
A fresh air duct of 4” (101mm) dia. should be installed from the fresh air source to the air intake connection on the burner housing. A flexible jointing piece should be installed at the burner connection (see optional extra kits Section 8) with hose clamps to facilitate expansion and contraction.

The maximum recommended length air duct is 25ft (7.6m) and the maximum number of elbows is two. The minimum length is 18” (456mm).

The fresh air duct inlet must be located where it will receive dust free clean air. An inlet cap with bird screen must be fitted at the inlet of the duct. If the duct inlet is located above the roof the underside of the inlet terminal must be at least 2ft(0.61m) above roof level and at least 10” (254mm) above any projection on the roof within 7ft (2.1m) of the inlet. Intake pipe Fittings and sealant are not supplied by the manufacturer. Refer to Figs. 6c & d.

Figure 6.a Vertical Venting.

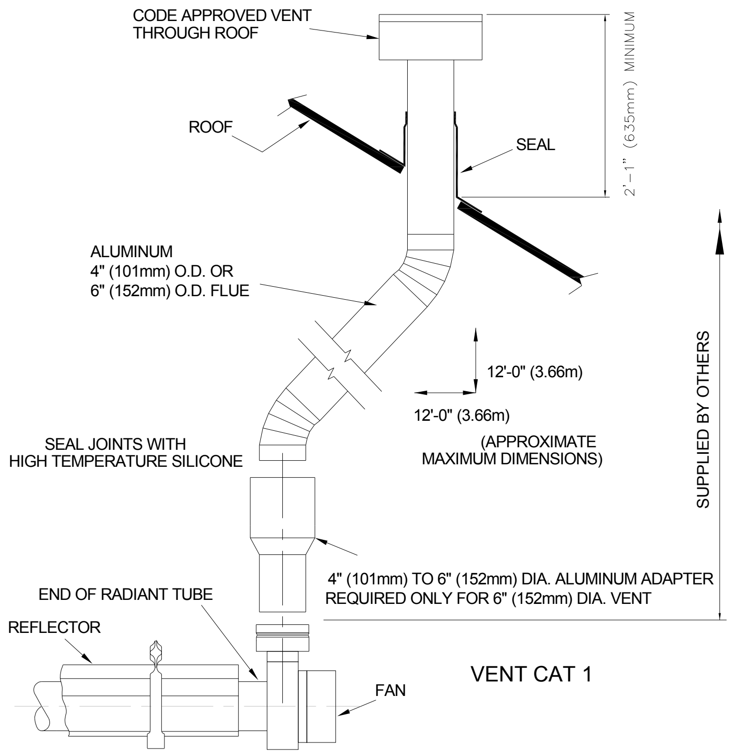
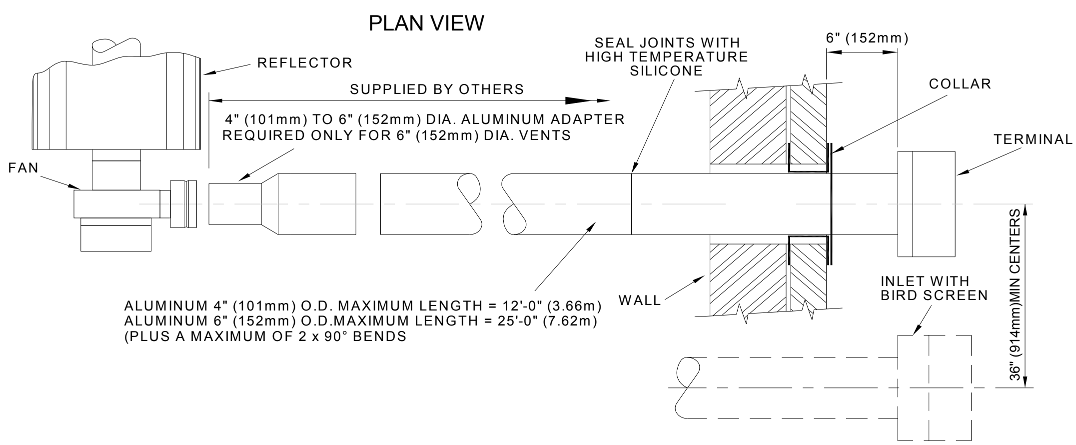


Figure 6.b Horizontal Venting.



NOTE: The vent terminal should be installed so as to be in the same atmospheric pressure zone as the combustion air inlet of the appliance

Figure 6.c Fresh Air Ducted Intake.

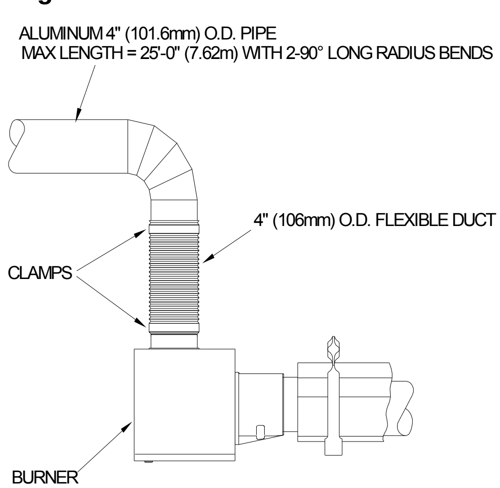
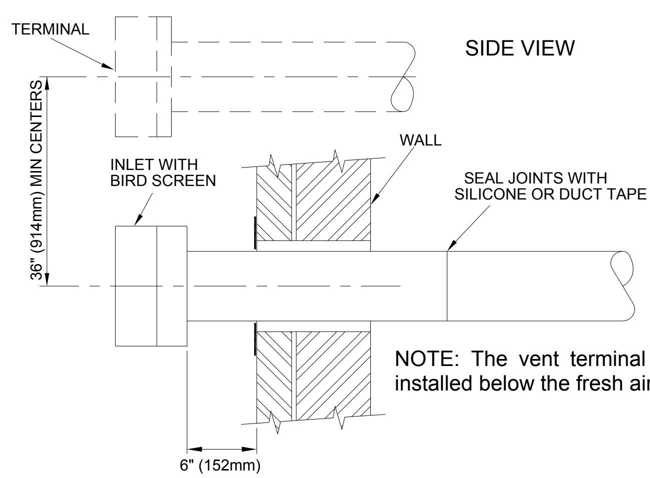


Figure 6.d Wall Terminal Intake Kit.



NOTE: The vent terminal must NOT be installed below the fresh air intake.

1.9 Technical Details

No of Injectors	1
Gas Connection	½" N.P.T nipple.
Electrical Supply	120 volt 1 phase 60Hz
Vent size (in)	4" or 6"
Unitary Fan Motor Details	120 volt 1 phase 60Hz
Current Rating	1.2A MAX
Ignition	Electronic Program Start up with Spark Ignition

Burner Size	**Natural Gas**	**Tube Size**	**Min. Heater Length**	**Max. Heater Length**	**Min. Heater Length**	**Max. Heater Length**
	BTU/Hr	**Inches (mm)**	**S ft (m)**	**S ft (m)**	**U ft (m)**	**U ft (m)**
40	45,720	3 (76)	20 (6.1)	30 (9.1)	20 (6.1)	30 (9.1)
60	60,000	3 (76)	20 (6.1)	40 (12.1)	20 (6.1)	40 (12.1)
80	80,000	3 (76)	25 (7.6)	40 (12.1)	30 (9.1)	40 (12.1)
100	100,000	4 (101)	30 (9.1)	50 (15.2)	34 (10.4)	34 (10.4)
125	125,000	4 (101)	40 (12.1)	60 (18.3)	34 (10.4)	44 (13.4)
150	150,000	4 (101)	40 (12.1)	60 (18.3)	34 (10.4)	44 (13.4)
170	175,000	4 (101)	50 (15.2)	70 (21.3)	44 (13.4)	64 (19.5)
200	200,000	4 (101)	50 (15.2)	80 (24.4)	54 (16.5)	74 (22.6)

0- 2000 ft (0-610m)

Burner Size	**Burner Orifice Plate**	**Injector**	**Combustion Fan Details**		**Pressure Switch**	**Burner Head**
	Part No.	Part No.	**Fan Type**	**Support Spinning**	Part No.	Part No.
40	201063-65	201007-13	2576T	201845	201676	200988
60	201063-36	201007-15		201841		
80	201063-64	201007-18		201841		
100	201063-70	201007-21		FSER38UK		
125	201063-26	201007-24	2560-1	FS100-4H-60DE		
150	201063-25	201007-30		FS100-4H-66DE		
170	201063-24	201631-25		FS100-4H-70DE		
200	201063-71	201631-32		FS100-4H-96DE		

USA	Natural Gas 0– 2000 ft (0-610m)							
Size	40	60	80	100	125	150	170	200
"WC	3.4	3.7	3.2	2.7	3.6	3.4	4.4	2.7

USA	Natural Gas 2001- 4000 ft (611-1220m)							
Size	40	60	80	100	125	150	170	200
"WC	3.2	3.5	3.0	2.6	3.4	3.2	4.2	2.6

CANADA	Natural Gas 0- 2000 ft (0-610m)							
Size	40	60	80	100	125	150	170	200
"WC	3.4	3.7	3.2	2.7	3.6	3.4	4.4	2.7

CANADA	Natural Gas 2001– 4500 ft (611-1370m)							
Size	40	60	80	100	125	150	170	200
"WC	3.2	3.5	3.0	2.6	3.4	3.2	4.2	2.6

Model	U Tube								Straight Tube							
	U20	U30	U40	U35	U45	U55	U65	U75	S20	S25	S30	S40	S50	S60	S70	S80
40	•	•							•	•	•					
60	•	•	•						•	•	•	•				
80		•	•							•	•	•				
100				•							•	•	•			
125				•	•							•	•	•		
150				•	•							•	•	•		
170					•	•	•						•	•	•	
200						•	•	•					•	•	•	•

Model	Tube Type Material			Linear Heater Min. Distance to Bend ft (m)
	U-Tube	Linear	All Heaters	
	Aluminized (or superior)	Aluminized (or superior)	Mild Steel (or superior)	
40	TUBE 1	TUBE 1	REMAINDER	10 (3.0)
60	TUBE 1	TUBE 1	REMAINDER	10 (3.0)
80	TUBE 1	TUBE 1	REMAINDER	20 (6.1)
100	TUBE 1	TUBE 1	REMAINDER	20 (6.1)
125	TUBE 1	TUBE 1	REMAINDER	20 (6.1)
150	TUBE 1	TUBE 1	REMAINDER	20 (6.1)
170	TUBE 1	TUBE 1 & 2	REMAINDER	30 (9.1)
200	TUBE 1	TUBE 1 & 2	REMAINDER	30 (9.1)

OPTIONS

1 All standard units fitted with unvented vent, natural gas and stainless steel or aluminized reflectors.
2 1 off 180° 'U' bend or up to 2 off 90° 'L' bends can be fitted at no less than 50% of the total heater length.
3 5ft tube kit (linear only).
4 4" (101mm) or 6" (152mm) vent terminal.
5 Combustion air kit.
6 Altitude conversion kit.
7 Stainless steel or aluminized steel reflectors.
8 End caps.

Table 7a: U-Tube Heater Tube Materials

Model number		BTU/Hr	Combustion tube length (ft)	Radiant tube length (ft)
40U20	3	45,720	10 (1-CC)	10 (1-MS)
60U20	3	60,000		
40U30	3	42,720	10 (1-CC)	10 (1-MS) 10 (2#5'-MS)
60U30	3	60,000		
80U30	3	80,000		
100U35	4	100,000	10 (1-AS)	10 (1-MS) 14 (2#7'-MS)
125U35	4	125,000		
150U35	4	150,000		
60U40	3	60,000	10 (1-CC)	30 (3#10'-MS)
80U40	3	80,000		
125U45	4	125,000	10 (1-AS)	10 (1-MS) 10 (2#5'-MS) 14 (2#7'-MS)
150U45	4	150,000		
170U45	4	175,000	10 (1-AS) 5 (1-AS)	10 (1-MS) 5 (1#5'-MS) 14 (2#7'-MS)
170U55	4	175,000	20 (2#10'-AS)	20 (2#10'-MS) 14 (2#7'-MS)
200U55	4	200,000		
170U65	4	175,000	20 (2#10'-AS)	20 (2#10'-MS) 10 (2#5'-MS) 14 (2#7'-MS)
200U65	4	200,000		
200U75	4	200,000	10 (2#10'-AS)	40 (4#10'-MS) 14 (2#7'-MS)

Tube nomenclature:

CC 4"-3" Combustion tube
AS Aluminum coated steel
MS Mild steel

Table 7b: Linear Heater Tube Materials

<table>
<tr><th>Model number</th><th>Tube diameter</th><th>BTU/Hr</th><th>Combustion tube length (ft)</th><th>Radiant tube length (ft)</th><th>Min distance to bend (ft)</th></tr>
<tr><td>40S20</td><td>3</td><td>45,720</td><td rowspan="2">10’ (1-CC)</td><td rowspan="2">10’ (1-MS)</td><td rowspan="2">10’</td></tr>
<tr><td>60S20</td><td>3</td><td>60,000</td></tr>
<tr><td>40S25</td><td>3</td><td>45,720</td><td rowspan="3">10’ (1-CC)</td><td rowspan="3">10’ (1-MS)
10’ (2#5’-MS)</td><td rowspan="2">10’</td></tr>
<tr><td>60S25</td><td>3</td><td>60,000</td></tr>
<tr><td>80S25</td><td>3</td><td>80,000</td><td>20’</td></tr>
<tr><td>40S30</td><td>3</td><td>45,720</td><td rowspan="3">10’ (1-CC)</td><td rowspan="3">20’ (2#10’-MS)</td><td rowspan="2">10’</td></tr>
<tr><td>60S30</td><td>3</td><td>60,000</td></tr>
<tr><td>80S30</td><td>3</td><td>80,000</td><td>20’</td></tr>
<tr><td>100S30</td><td>4</td><td>100,000</td><td>10’ (1-AS)</td><td>20’ (2#10’-MS)</td><td>20’</td></tr>
<tr><td>60S40</td><td>3</td><td>60,000</td><td rowspan="2">10’ (1-CC)</td><td rowspan="2">30’ (3#10’-MS)</td><td>10’</td></tr>
<tr><td>80S40</td><td>3</td><td>80,000</td><td>20’</td></tr>
<tr><td>100S40</td><td>4</td><td>100,000</td><td rowspan="3">10’ (1-AS)</td><td rowspan="3">30’ (3#10’-MS)</td><td rowspan="3">20’</td></tr>
<tr><td>125S40</td><td>4</td><td>125,000</td></tr>
<tr><td>150S40</td><td>4</td><td>150,000</td></tr>
<tr><td>100S50</td><td>4</td><td>100,000</td><td rowspan="3">10’ (1-AS)</td><td rowspan="3">40’ (4#10’-MS)</td><td rowspan="3">20’</td></tr>
<tr><td>125S50</td><td>4</td><td>125,000</td></tr>
<tr><td>150S50</td><td>4</td><td>150,000</td></tr>
<tr><td>170S50</td><td>4</td><td>175,000</td><td rowspan="2">20’ (2#10’-AS)</td><td rowspan="2">30’ (3#10’-MS)</td><td rowspan="2">30’</td></tr>
<tr><td>200S50</td><td>4</td><td>200,000</td></tr>
<tr><td>125S60</td><td>4</td><td>125,000</td><td rowspan="2">10’ (1-AS)</td><td rowspan="2">50’ (5#10’-MS)</td><td rowspan="2">20’</td></tr>
<tr><td>150S60</td><td>4</td><td>150,000</td></tr>
<tr><td>170S60</td><td>4</td><td>175,000</td><td rowspan="2">20’ (2#10’-AS)</td><td rowspan="2">40’ (4#10’-MS)</td><td rowspan="2">30’</td></tr>
<tr><td>200S60</td><td>4</td><td>200,000</td></tr>
<tr><td>170S70</td><td>4</td><td>175,000</td><td rowspan="2">20’ (2#10’-AS)</td><td rowspan="2">50’ (5#10’-MS)</td><td rowspan="2">30’</td></tr>
<tr><td>200S70</td><td>4</td><td>200,000</td></tr>
<tr><td>200S80</td><td>4</td><td>200,000</td><td>20’ (2#10’-AS)</td><td>60’ (6#10’-MS)</td><td>30’</td></tr>
</table>

Tube nomenclature:

CC 4”-3” Combustion tube
AS Aluminum coated steel tube
MS Mild steel tube

2. Assembly Instructions.

PLEASE READ *this section prior to assembly to familiarize yourself with the components and tools you require at the various stages of assembly. Carefully open the packaging and check the contents against the parts and check list.*

The manufacturer reserves the right to alter specifications without prior notice.

Please ensure that all packaging is disposed of in a safe environmentally friendly way.

For your own safety we recommend the use of safety boots and leather faced gloves when handling sharp or heavy items. The use of protective eye wear is also recommended.

2.1 Tools Required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.

Suitable alternative tools may be used.



Saw Horses



Leather Faced Gloves



Phillips Screwdriver



Wrench Set



Cordless Drill



5/16” Drive



3/16” (5mm) 5/32” (4mm) Allen wrench



Tape Measure

2.2 Assembly Notes.

Please read *these assembly notes in conjunction with the correct assembly drawings (figs 10 to 27).*

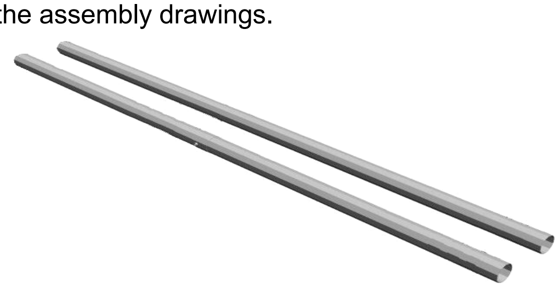
2.2.1 Tubes

Each heating unit has two types of emitter tubes. See Table 7a and 7b of this manual.

Identify and position tubes on saw horses. **All tubes should be positioned with seams facing down when installed.** Position coupling fastener so that these cannot be seen from beneath the heater.

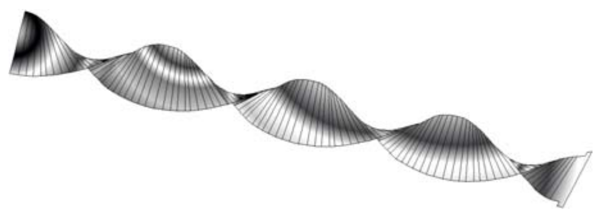
3” heater versions have a 4” diameter burner spigot welded at one end. Ensure this tube assembly is correctly positioned as shown on the assembly drawings.

Where necessary, mark out the position of the bracket centres from the dimensions shown on the assembly drawings.



2.2.2 Turbulators

All models include a turbulator or a set of turbulators. Carefully insert turbulator(s) inside the tube up to the end tab.



Turbulator lengths and positioning inside the tube vary between models.

Always ensure correct turbulator is fully inserted into the correct tube and from the correct end. Failure to ensure this practice could cause the heater to fail.

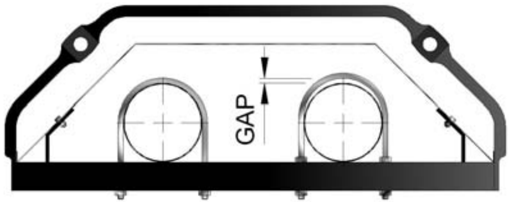
Turbulator dimensions and positioning are indicated on individual assembly drawings (fig.10 to fig.27).

2.2.3 Brackets

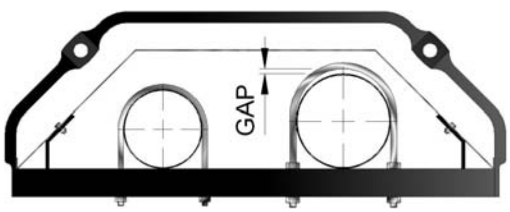
Always ensure correct bracket is used. *Bracket type and positioning are indicated on individual assembly drawings (fig.10 to fig.27).*

2.2.3.1 U-Tube Heaters

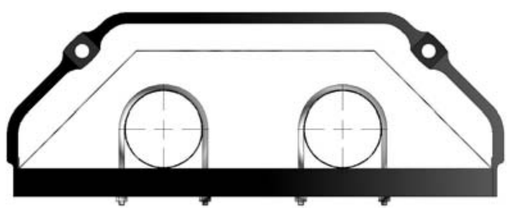
- ***Type 'A2'*** *is a fixed reflector suspension bracket, tabbed with reflector fixing points. An extra long 'floating U bolt' with 'stop nuts' is located on the firing tube ONLY as indicated and bolted into position.*
  Clearance of 1/8" must be provided above the tube to allow for thermal expansion.



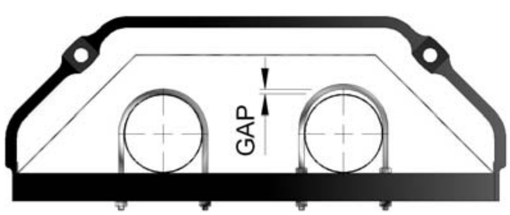
- ***Type 'A3'*** *is a fixed reflector suspension bracket, tabbed with reflector fixing points. An oversized extra long 'floating U bolt' with 'stop nuts' is located on the 4" burner tube ONLY as indicated and bolted into position.*
  Clearance of 1/8" must be provided above the tube to allow for thermal expansion.
  *This bracket is **ALWAYS** closest to the burner.*



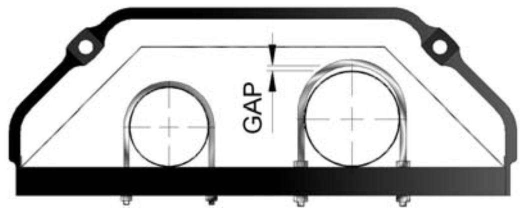
- ***Type 'B'*** *is a sliding reflector suspension bracket and NOT fastened to the reflector.*



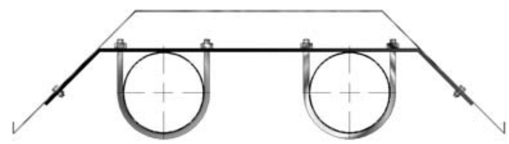
- ***Type 'B2'*** *is a sliding reflector suspension bracket.*
  An extra long 'floating U bolt' with 'stop nuts' is located on the firing tube ONLY as indicated and bolted into position.
  Clearance of 1/8" must be provided above the tube to allow for thermal expansion.



- ***Type 'B3'*** *is a sliding reflector suspension bracket and NOT fastened to the reflector.*
  An oversized extra long 'floating U bolt' with 'stop nuts' is located on the 4" burner tube ONLY as indicated and bolted into position.
  Clearance of 1/8" must be provided above the tube to allow for thermal expansion.



- ***Type 'C'*** *is a reflector support bracket to retain the reflector (certain UT models).*



Slip the brackets onto the tubes in correct order and fix at correct points as shown on the relevant assembly drawing.
Ensure fixings are tight to brackets

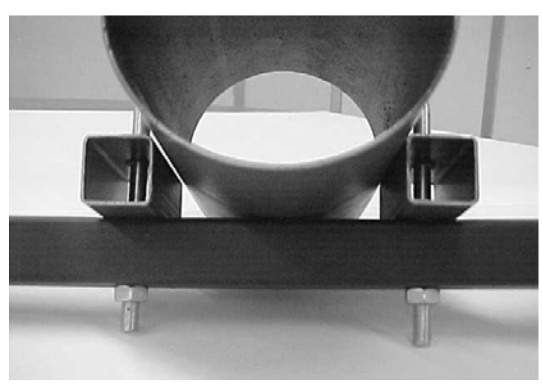
> *Note. The first bracket, 'A3' on 3" UT heaters have an oversized 'U' bolt on the burner leg to accommodate the 4" burner spigot.*

2.2.3.2 Tube alignment sections

(For 170 & 200 U-Tube Angle Mounted Installations ONLY).

To allow for differential expansion of the tubes, a tube alignment assembly is fitted to the first bracket on the fan side radiant tube.

Position U bolt tube alignment sections over the tube and through bracket prior to clamping.



2.2.3.3 Linear 3" SL Tube Heaters

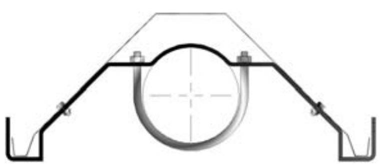
- *Type 'A1' is a fixed reflector suspension bracket, tabbed with reflector fixing points. An oversized 'U' bolt is located on the 4" burner tube only as indicated and bolted into position.*
  *This bracket is **ALWAYS** closest to the burner.*



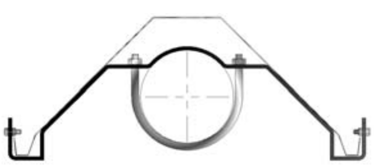
- *Type 'B' is a sliding reflector suspension bracket and NOT fastened to the reflector. They are fixed at regular intervals down the length of the tube.*



- *Type 'F' is a fixed reflector support bracket and are fixed to the reflector via set screws.*



- *Type 'S' is a sliding reflector support bracket and NOT fastened to the reflector which allow the reflector to move within.*



Slip the brackets onto the tubes in correct order and fix at correct points as shown on the relevant assembly drawing.

Ensure fixings are tight to brackets

> *Note. The first bracket, 'A1' on 3" UT heaters have an oversized 'U' bolt on the burner leg to accommodate the 4" burner spigot.*

2.2.3.4 Linear - 4" SL Tube Heaters

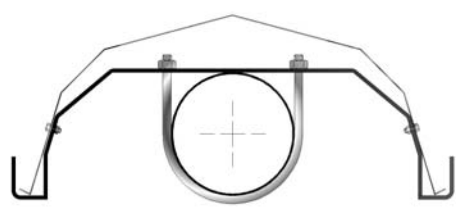
- *Type 'A' is a fixed reflector suspension bracket, tabbed with reflector fixing points.*
  *This bracket is **ALWAYS** closest to the burner.*



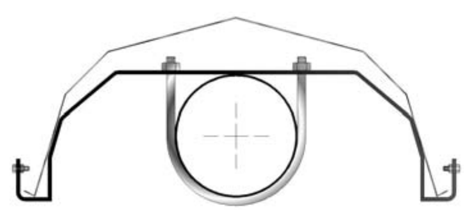
- *Type 'B' is a sliding reflector suspension bracket and NOT fastened to the reflector. They are fixed at regular intervals down the length of the tube.*



- *Type 'F' is a fixed reflector support bracket and are fixed to the reflector via set screws.*



- *Type 'S' is a sliding reflector support bracket and NOT fastened to the reflector which allow the reflector to move within.*



Slip the brackets onto the tubes in correct order and fix at correct points as shown on the relevant assembly drawing.

Ensure fixings are tight to brackets

2.2.4 Couplers

There are two types of 3” and 4” couplers for joining radiant tubes, bends or optional bend kits as detailed in Table 8 opposite.

A high temperature stainless steel coupling.



Slide the coupler over the tube ensuring that the rivet stop has butted up to the tube ends. Using an Allen wrench, tighten the pins.

Moving between the two set pins, tighten both ensuring that equal pressure is applied to each set pin in turn. Complete assembly by drilling and screwing self tapping retention zip screws.

A standard stainless steel coupling which is used for all other connections.



Slide the coupler over the tube ensuring that the tube stop has butted up to the tube ends. Using a 5/16” drive or flat blade screwdriver, tighten the bolts.

Moving between the two band coupling bolts, tighten both ensuring that equal pressure is applied to each in turn. Complete assembly by drilling and screwing self tapping retention zip screws.

DO NOT OVERTIGHTEN!!

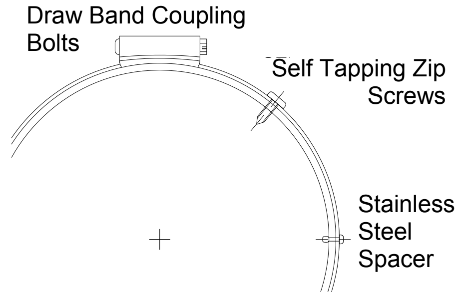


Table 8. Coupler positions (from burner)

U-Tube	1st coupler	2nd coupler	Remainder
40-100	Standard	Standard	Standard
125-200	Hi-temp	Standard	Standard
Linear	**1st coupler**	**2nd coupler**	**Remainder**
40-100	Standard	Standard	Standard
125-150	Hi-temp	Standard	Standard
170-200	Hi-temp	Hi-temp	Standard

At this point raise the tube assembly into position and suspend from previously fixed chains (2/0 min. gauge), or attach to wall mounting brackets. Wall mounting brackets must support heater at an angle of inclination of 45° ± 10°. Longer tube assemblies may be raised in more than one sub-assembly with final tube connection made in the air.
It is recommended that the heater be suspended to slope slightly - refer to note in figure 1 for details

2.2.5 Reflectors.

All reflectors must be positioned/ attached to the brackets exactly as detailed in the assembly drawings.

All reflectors are shipped with a protective plastic coating which MUST be removed before use.

U-Tube models only. After removing the protective plastic coating, slip the first reflector through the brackets until the locating slots align with the type A bracket fixing points.
* Note: the first suspension bracket may not necessarily be a fixed type ‘A’ bracket.

Slide the next reflector backwards through the brackets and overlap the existing reflector until the locating slots line up with the type ‘A’ bracket.

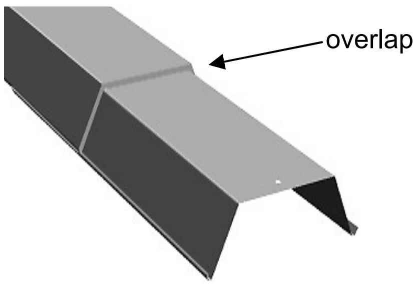
Continue along the heater where necessary.

Secure overlapped reflectors onto all type ‘A’ brackets using nuts, bolts and flat mud washers.

All other suspension brackets along the tube are type ‘B’

Linear models only. After removing the protective plastic coating, slip the first reflector through the brackets until the locating slots align with the first type ‘A’ suspension bracket fixing point. Secure using nuts, bolts and flat mud washers.

> *Each subsequent reflector must* ***OVERLAP*** *the previous one as shown below and to a distance as indicated by their individual assembly sheets.*



Slide the next reflector backwards through the brackets and **overlap** the existing reflector until the locating slots line up with the type ‘F’ reflector support bracket.

Adjust the type ‘F’ bracket along the tube to give the correct overlap as shown in the relevant assembly sheet. Secure U bolt to tube in this position.

Slide the next reflector through the brackets and **overlap** the existing reflector until the locating slots line up with the previous reflector slots and type ‘F’ reflector support bracket.

Secure all three items using nuts, bolts and flat mud washers.

Continue along the heater where necessary.

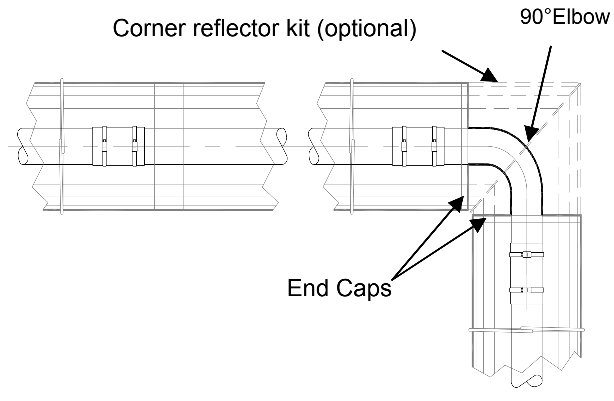
2.2.6 U Bend.

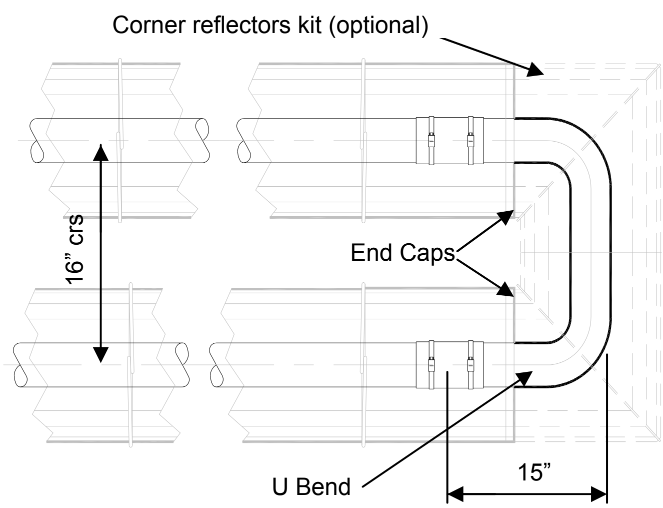
For U-Tube models only. Slide the ‘U’ bend onto the tube ends with the clamping bolts facing upwards until the predefined stop position. Tighten clamping bolt arrangement using socket and wrench.

2.2.7 Bend(s) (where fitted)

The heater can be installed with 1 or 2 90° bends, or a 180° U bend.
Slide the bend into the open end of the coupler ensuring that the screw stop has butted up to the tube ends. Refer to 2.2.4 for fastening.

Typical usage of optional bend kits:





> *Bends must be fitted at a distance of at least 50% of the total heat exchanger e.g. for a 60ft long heater, the closest to the burner a bend can be is 30ft.*

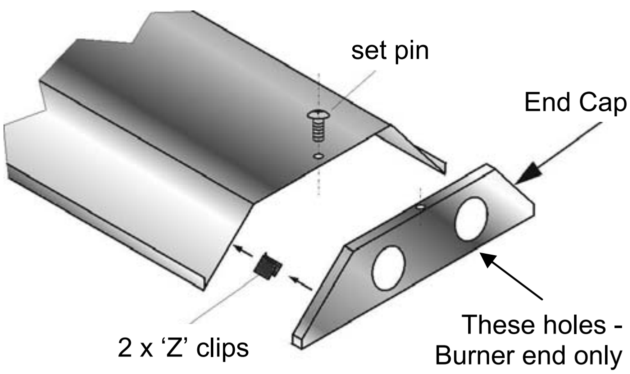
2.2.8 End Caps.

On U-Tube models only, position the end cap with no tube holes beneath the reflector profile at the U bend end with the end cap flanges facing inwards.

Fasten to reflector using cross point set pin and 'Z' clips.

Position the end cap with tube holes beneath the reflector profile at the burner end with the end cap flanges facing inwards.
Fasten to reflector using cross point set pin and 'Z' clips.

> *NOTE: on 3" models, the end cap at the burner end will have one larger hole to accommodate the larger 4" combustion chamber spigot.*



On linear models only, position ONE end cap beneath the reflector profile at the fan end with the end cap flanges facing inwards.

Fasten to reflector using 'Z' clips.

Position the other end cap beneath the reflector profile at the burner end with the end cap flanges facing inwards.

Fasten to reflector using 'Z' clips.

2.2.9 Burner Assembly.

On U-Tube models only, slide the burner assembly onto the **RIGHT HAND TUBE** when viewed from above, ensuring it is fully engaged. Secure with set pins.

On linear models only, slide the burner assembly onto the **inlet end of the tube** ensuring it is fully engaged. Secure with set pins.

2.2.10 Fan Assembly.

On U-Tube models only, slide fan onto the left hand tube ensuring it is fully engaged.

On linear models only, slide fan onto the opposite end to the burner ensuring it is fully engaged.

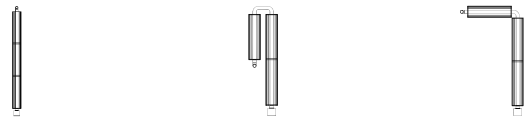
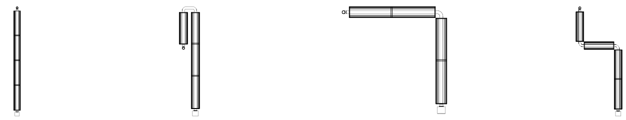
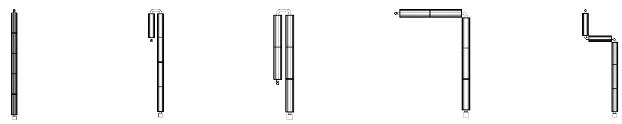
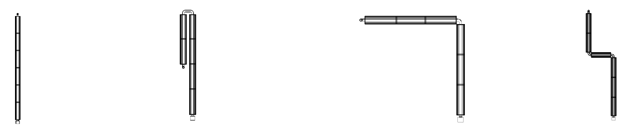
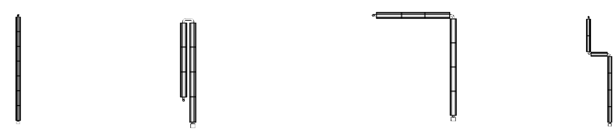
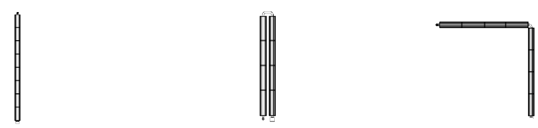
The fan discharge should face vertically or horizontally for individually vented or horizontally away from the burner if unvented.

2.2.11 Heater Configurations.

The following pages show the technical dimensional details for the u-tube and linear range of heaters.

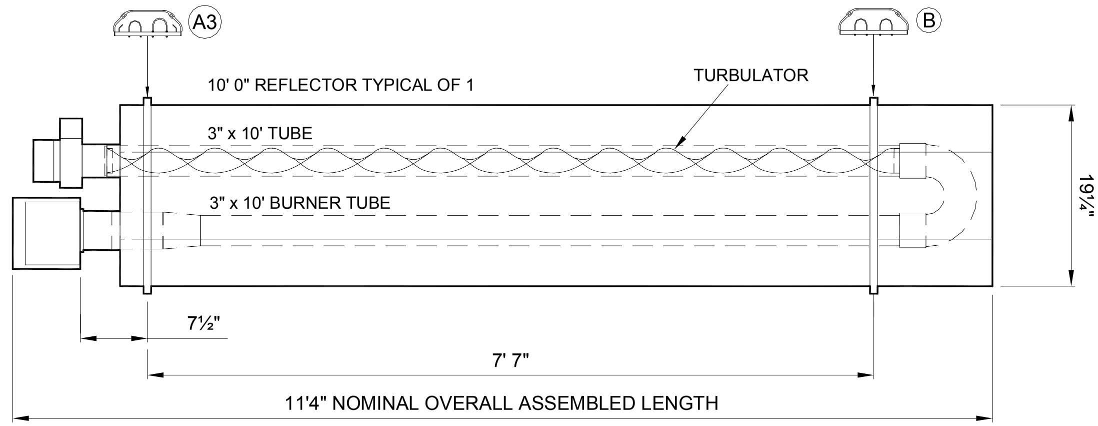
Please note the heater type, length and reference number from the delivery/advice note before identifying the correct drawing for that model.

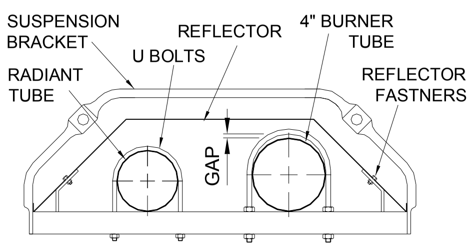
Table 9. Possible Heater Orientations

S30	
S40	
S50	
S60	
S70	
S80	

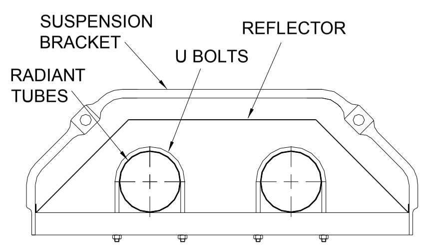
Bends must be fitted at a distance of at least 50% of the total heat exchanger length from the burner, e.g. for a 60ft long heater, the closest to the burner a bend can be is 30ft.

Figure 10. Heater Assembly: Model U tube 40U20 and 60U20.

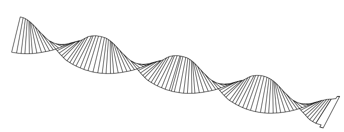




FIRST POINT SUSPENSION BRACKET TYPE A
3" + 4" BURNER U BOLT. DETAIL (A3) # 201820



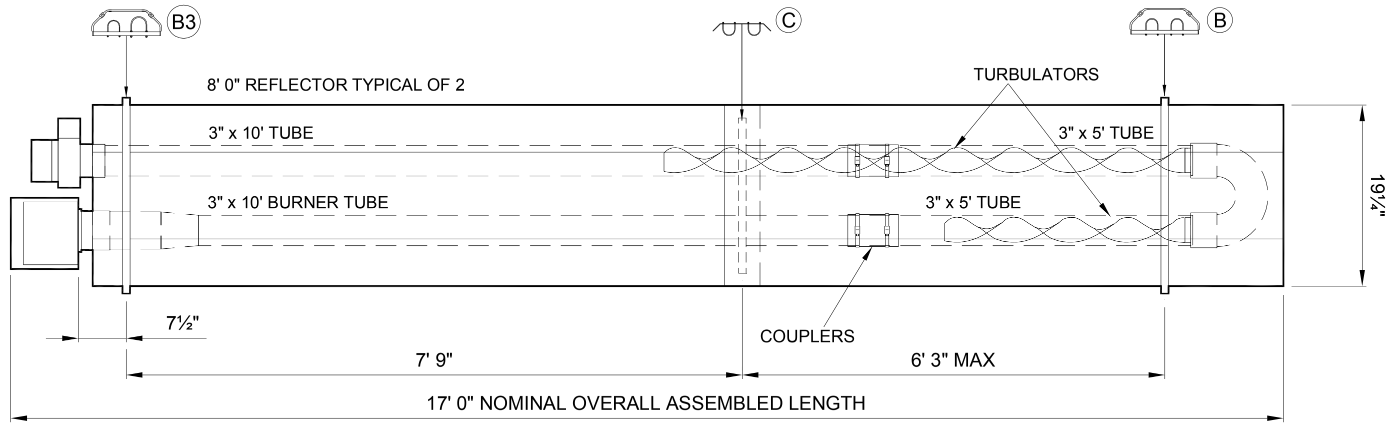
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6576-SUB

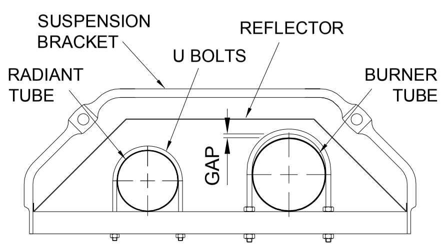


9'2" (2800mm) TURBULATOR DETAIL
RETURN TUBE FROM FAN END

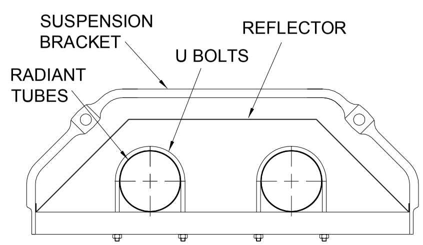
MODEL NUMBER	BTU/HR
40-U20	**45,720**
60-U20	**60,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUNINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	1 no T-3103
REFLECTOR 10' **ALUMINUM** *or*	1 no 202191
REFLECTOR 10' **STAINLESS STEEL**	or 1 no 201818
END CAP PLAIN **ALUMINUM**	1 no 3294PMF
END CAP HOLE **ALUMINUM** *or*	1 no 202196
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3178PMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 201803
BRACKET SET	1 no BR3UTU20
TURBULATOR	1 no 201823T
FAN	1 no 2576T

Figure 11. Heater Assembly: Model U tube 40U30, 60U30 and 80U30.

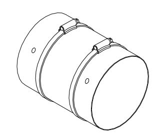


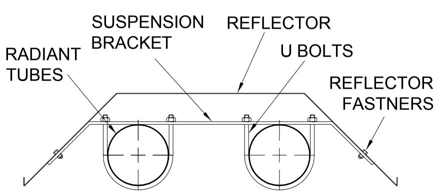


FIRST POINT SUSPENSION BRACKET TYPE B
3" + 4" BURNER U BOLT. DETAIL (B3) # 201821

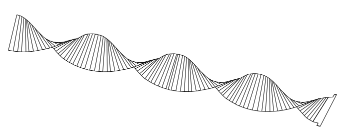


SUSPENSION BRACKET TYPE B
DETAIL (B) # 6576-SUB


STANDARD
3" COUPLER



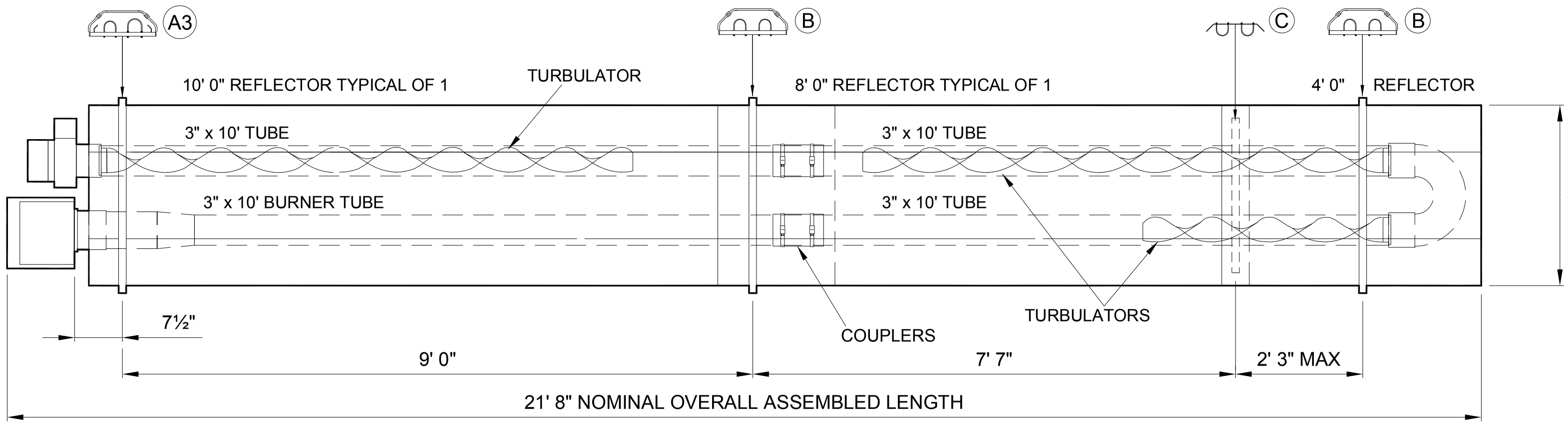
REFLECTOR SUPPORT BRACKET TYPE C
DETAIL (C) # 6575

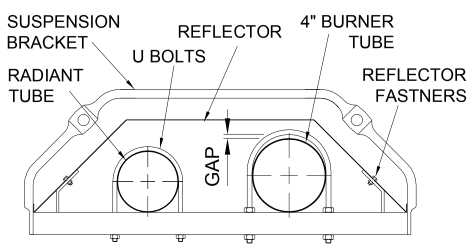

4'3" (1300mm) - BURNER TUBE
7'6" (2285mm) - FAN TUBE
TURBULATOR DETAIL

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST.

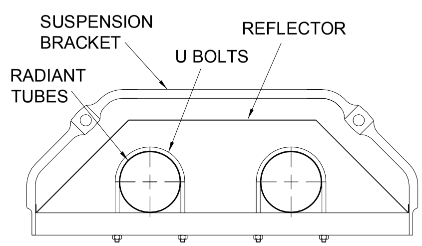
MODEL NUMBER	BTU/HR
40-U30	**45,720**
60-U30	**60,000**
80-U30	**80,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	1 no T-3103
RADIANT TUBE 5' **MILD STEEL**	2 no T-3154
REFLECTOR 8' **ALUMINUM** *or*	2 no 202193
REFLECTOR 8' **STAINLESS STEEL**	or 2 no 1260
END CAP PLAIN **ALUMINUM**	1 no 3294PMF
END CAP HOLE **ALUMINUM** *or*	1 no 202196
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3178PMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 201803
BRACKET SET	1 no BR3UTU30
TURBULATOR (BURNER TUBE)	1 no 6600T
TURBULATOR (FAN TUBE)	1 no 6614T
FAN	1 no 2576T

Figure 12. Heater Assembly: Model U tube 60U40 and 80U40

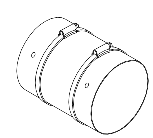




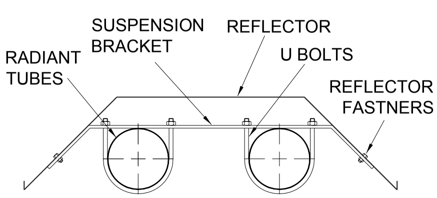
FIRST POINT SUSPENSION BRACKET TYPE A
3" + 4" BURNER U BOLT. DETAIL (A3) # 201820



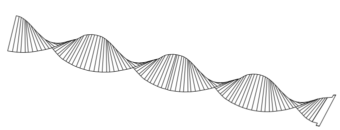
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6576-SUB



STANDARD
3" COUPLER



REFLECTOR SUPPORT BRACKET TYPE C
DETAIL (C) # 6575

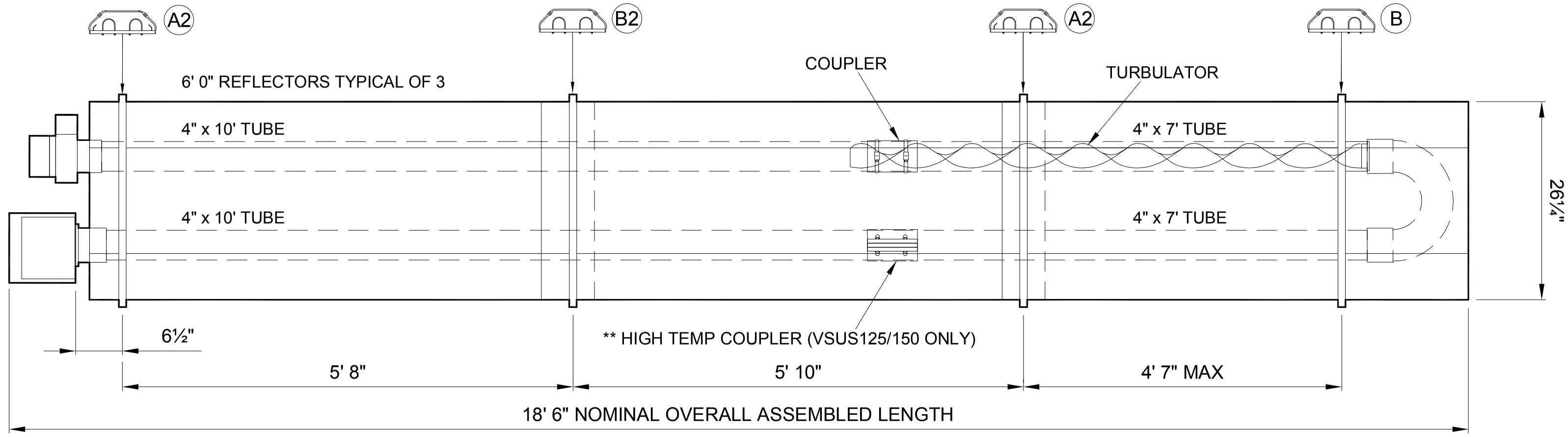


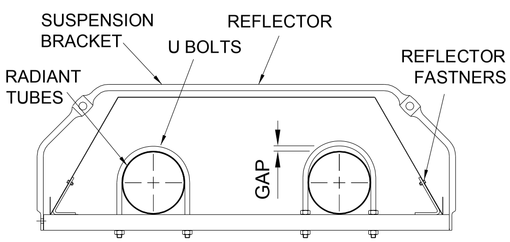
4'3" (1300mm) - BURNER TUBE
7'6" (2285mm) - FAN TUBE FROM BOTH ENDS
TURBULATOR DETAIL

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND.

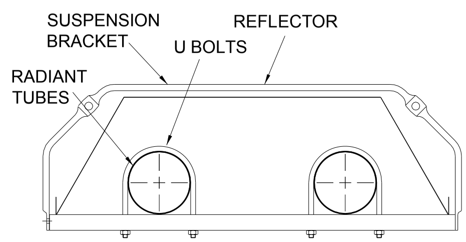
MODEL NUMBER	BTU/HR
60-U40	**60,000**
80-U40	**80,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	3 no T-3103
REFLECTOR 10' **ALUMINUM** *or*	1 no 202191
REFLECTOR 10' **STAINLESS STEEL**	or 1 no 201818
REFLECTOR 8' **ALUMINUM** *or*	1 no 202193
REFLECTOR 8' **STAINLESS STEEL**	or 1 no 1260
REFLECTOR 4' **ALUMINUM** *or*	1 no 202194
REFLECTOR 4' **STAINLESS STEEL**	or 1 no 1349-1
END CAP PLAIN **ALUMINUM**	1 no 3294PMF
END CAP HOLE **ALUMINUM** *or*	1 no 202196
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3178PMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 201803
BRACKET SET	1 no BR3UTU40
TURBULATOR (BURNER TUBE)	1 no 6600T
TURBULATOR (FAN TUBE)	2 no 6614T
FAN	1 no 2576T

Figure 13. Heater Assembly: Model U tube 100U35, 125U35 and 150U35

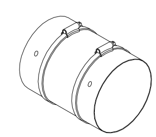




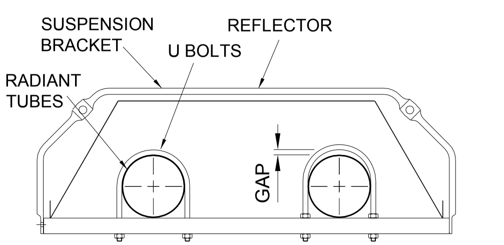
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A2) # 6579-SUB



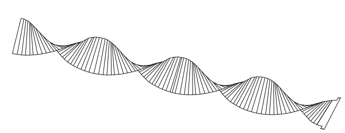
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6580-SUB



STANDARD
4" COUPLER

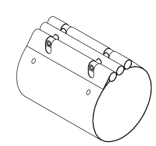


SUSPENSION BRACKET TYPE B
4" BURNER U BOLT. DETAIL (B2) # 6580-SUB



8'6" (2600mm) TURBULATOR DETAIL
RETURN TUBE FROM FAN END

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND.

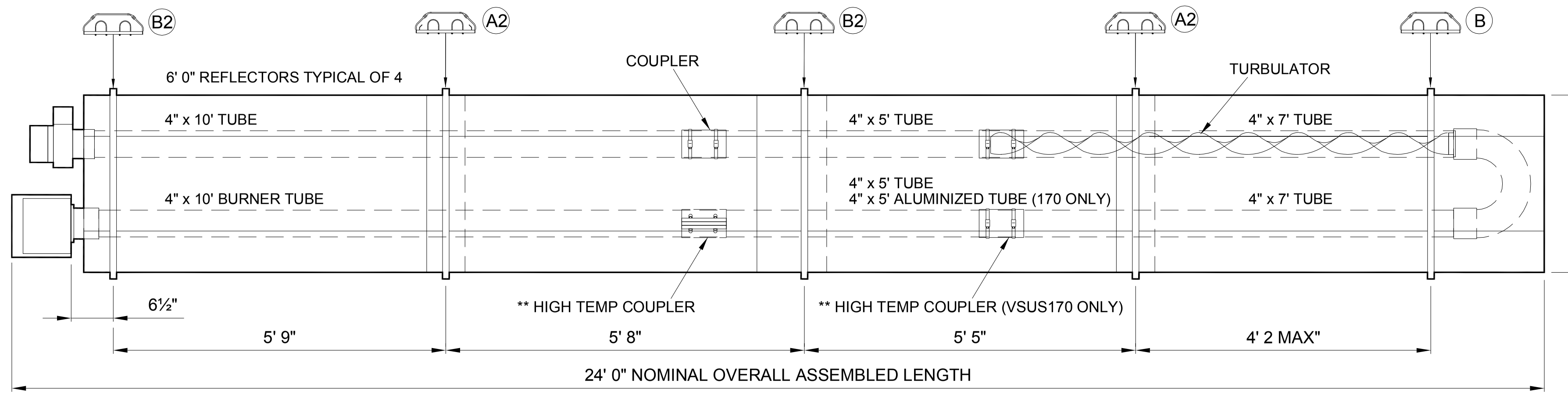


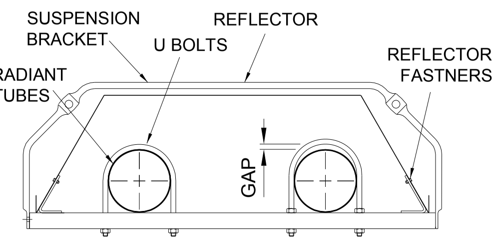
**HIGH TEMP
4" COUPLER

MODEL NUMBER	BTU/HR
100-U35	**100,000**
125-U35	**125,000**
150-U35	**150,000**

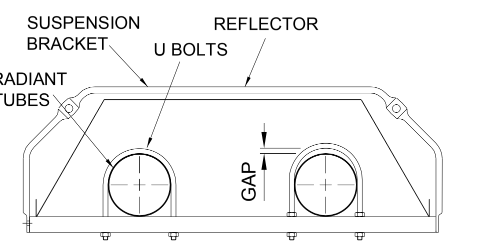
PARTS LIST	PART #
BURNER TUBE 10' **ALUMINIZED**	1 no T-4101
RADIANT TUBE 10' **MILD STEEL**	1 no T-4103
RADIANT TUBE 7' **MILD STEEL**	2 no T-4073
REFLECTOR 6' **ALUMINUM** *or*	3 no 202195
REFLECTOR 6' **STAINLESS STEEL**	or 3 no 1265
END CAP (SET) **ALUMINUM** *or*	1 no 3293-SUB
END CAP (SET) **STAINLESS STEEL**	or 1 no 3182-SUB
BRACKET SET	1 no BR4UTU35
TURBULATOR (FAN TUBE)	1 no 6619T
** HT COUPLER (125 & 150)	1 no C112110
FAN (100 & 125)	1 no 2576T
FAN (150)	1 no 2560-1

Figure 14. Heater Assembly: Model U tube 125U45, 150U45 and 170U45

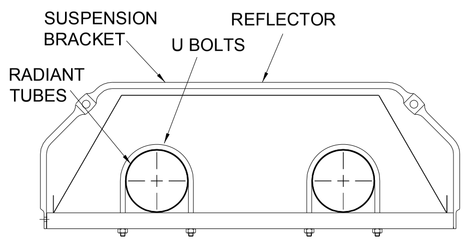




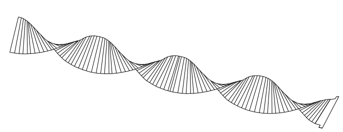
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A2) # 6579-SUB



SUSPENSION BRACKET TYPE B
4" BURNER U BOLT. DETAIL (B2) # 6580-SUB

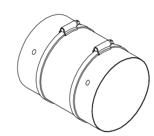


SUSPENSION BRACKET TYPE B
DETAIL (B) # 6580-SUB

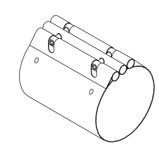


8'6" (2600mm) TURBULATOR DETAIL
RETURN TUBE FROM FAN END

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.



STANDARD
4" COUPLER

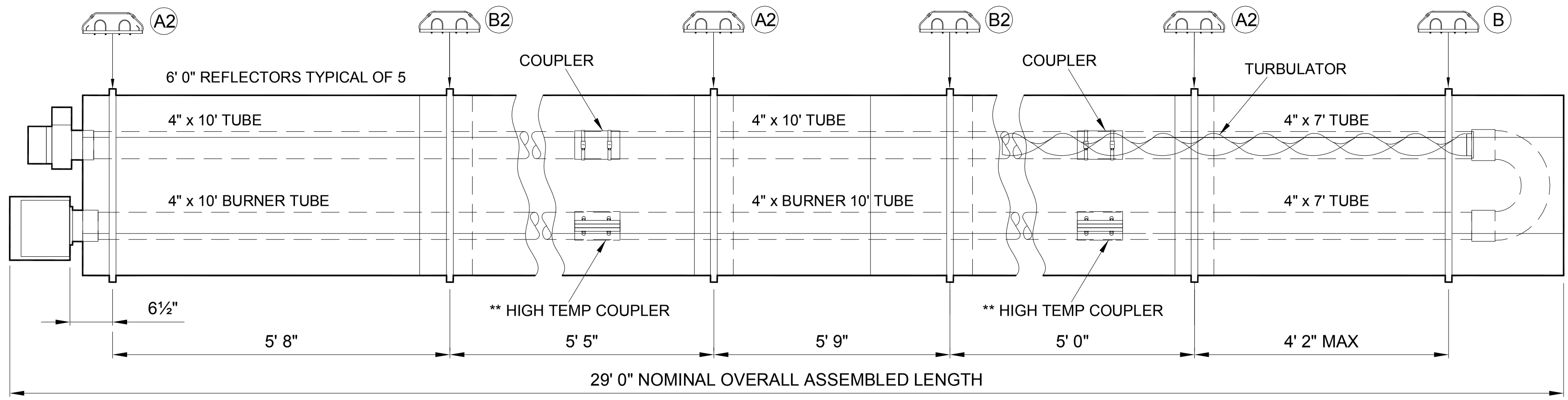


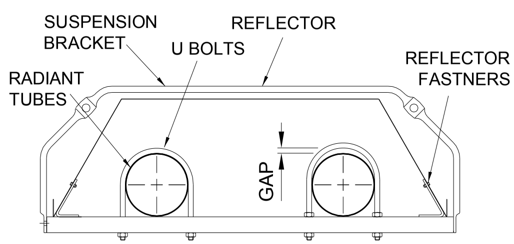
**HIGH TEMP
4" COUPLER

MODEL NUMBER	BTU/HR
125-U45	**125,000**
150-U45	**150,000**
170-U45	**175,000**

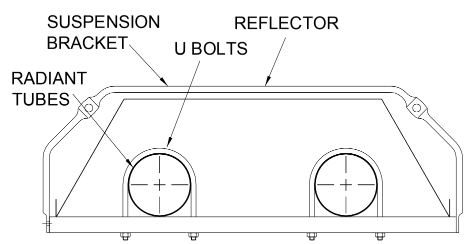
PARTS LIST	PART #
BURNER TUBE 10' **ALUMINIZED**	1 no T-4101
BURNER TUBE 5' **ALUMINIZED** (170 ONLY)	1 no T-4106
RADIANT TUBE 10' **MILD STEEL**	2 no T-4103
RADIANT TUBE 7' **MILD STEEL**	2 no T-4073
RADIANT TUBE 5' **MILD STEEL** (170 ONLY)	1 no T-4053
RADIANT TUBE 5' **MILD STEEL** (125/150)	2 no T-4053
REFLECTOR 6' **ALUMINUM** *or*	4 no 202195
REFLECTOR 6' **STAINLESS STEEL**	or 4 no 1265
END CAP (SET) **ALUMINUM** *or*	1 no 3293-SUB
END CAP (SET) **STAINLESS STEEL**	or 1 no 3182-SUB
BRACKET SET	1 no BR4UTU45
TURBULATOR (FAN TUBE)	1 no 6619T
** HT COUPLER (125 & 150)	1 no C112110
** HT COUPLER (170 ONLY)	2 no C112110
FAN (125)	1 no 2576T
FAN (150 & 170)	1 no 2560-1

Figure 15. Heater Assembly: Model U tube 170U55 and 200U55

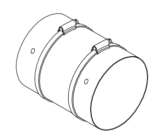




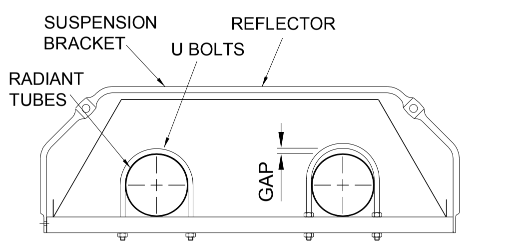
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A2) # 6579-SUB



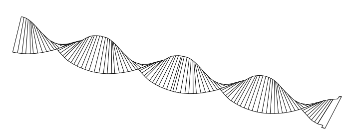
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6580-SUB



STANDARD
4" COUPLER

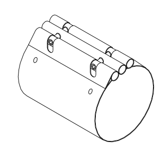


SUSPENSION BRACKET TYPE B
4" BURNER U BOLT. DETAIL (B2) # 6580-SUB



8'6" (2600mm) TURBULATOR DETAIL
RETURN TUBE FROM FAN END

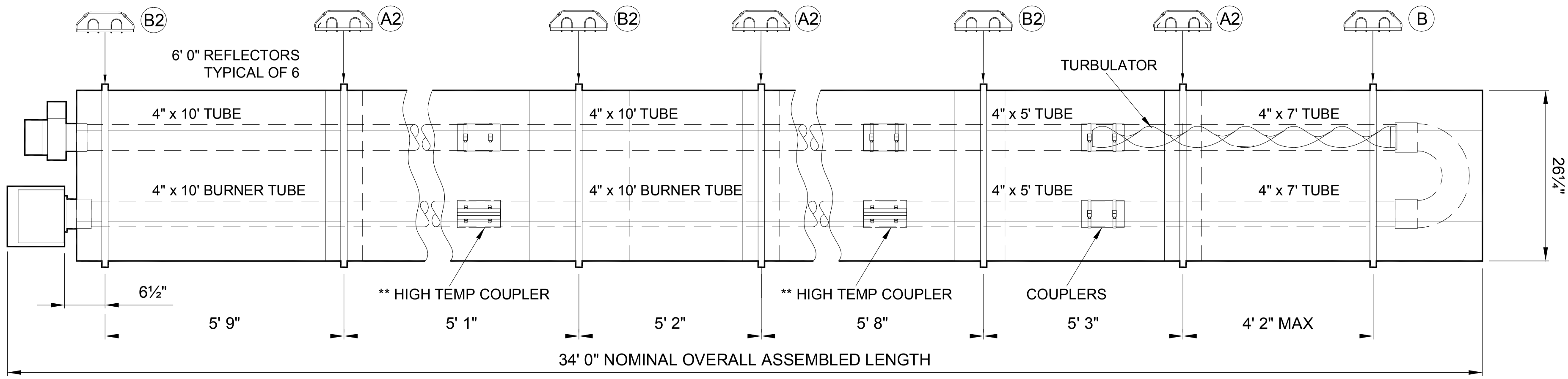
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

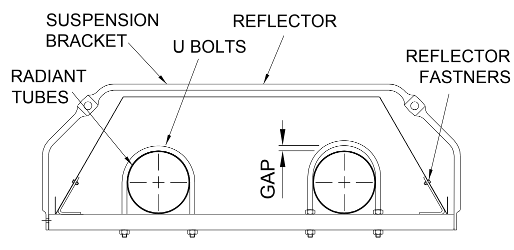


**HIGH TEMP
4" COUPLER

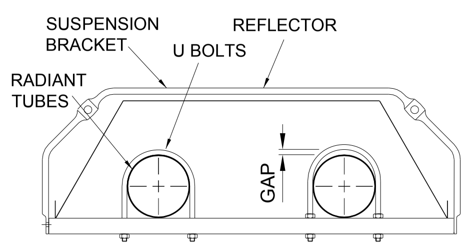
MODEL NUMBER	**BTU/HR**
170-U55	**175,000**
200-U55	**200,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	2 no T-4101
RADIANT TUBE 10' **MILD STEEL**	2 no T-4103
RADIANT TUBE 7' **MILD STEEL**	2 no T-4073
REFLECTOR 6' **ALUMINUM** *or*	5 no 202195
REFLECTOR 6' **STAINLESS STEEL**	or 5 no 1265
END CAP (SET) **ALUMINUM** *or*	1 no 3293-SUB
END CAP (SET) **STAINLESS STEEL**	or 1 no 3182-SUB
BRACKET SET	1 no BR4UTU55
TURBULATOR (FAN TUBE)	1 no 6619T
** HT COUPLER	2 no C112110
FAN	1 no 2560-1

Figure 16. Heater Assembly: Model U tube 170U65 and 200U65

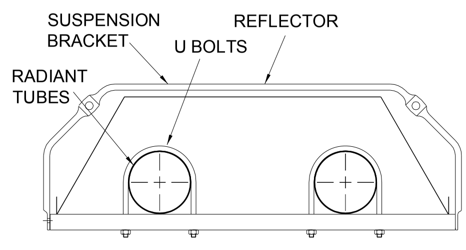




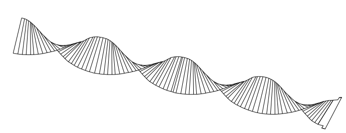
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A2) # 6579-SUB



SUSPENSION BRACKET TYPE B
4" BURNER U BOLT. DETAIL (B2) # 6580-SUB

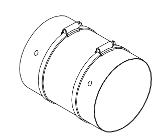


SUSPENSION BRACKET TYPE B
DETAIL (B) # 6580-SUB

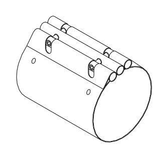


8'6" (2600mm) TURBULATOR DETAIL
RETURN TUBE FROM FAN END

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.



STANDARD
4" COUPLER

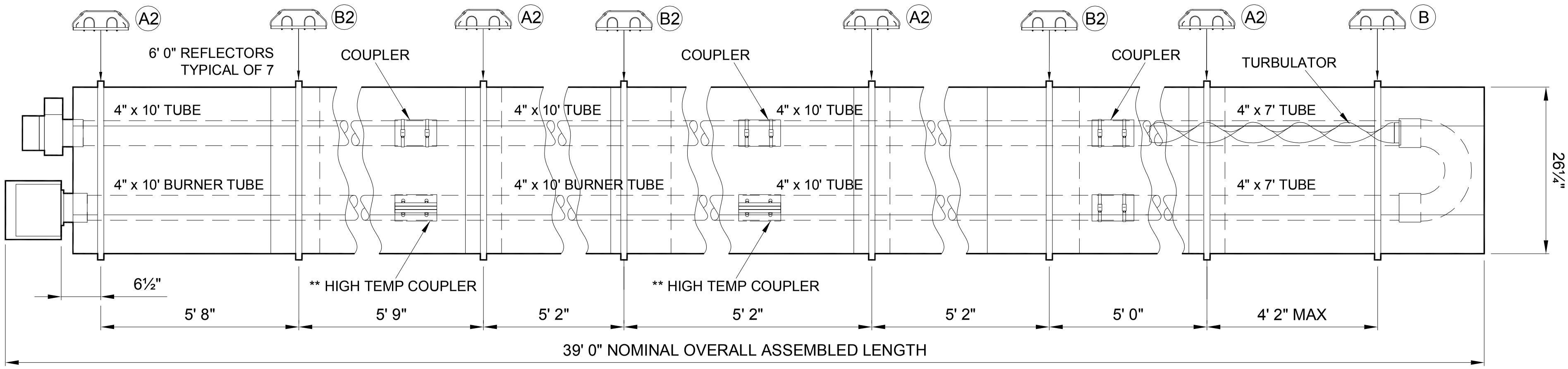


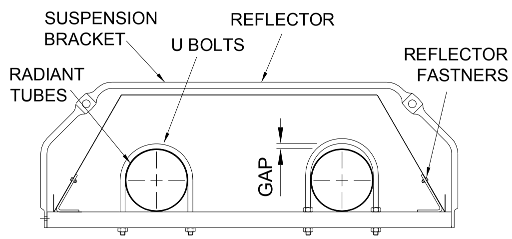
**HIGH TEMP
4" COUPLER

MODEL NUMBER	**BTU/HR**
170-U65	**175,000**
200-U65	**200,000**

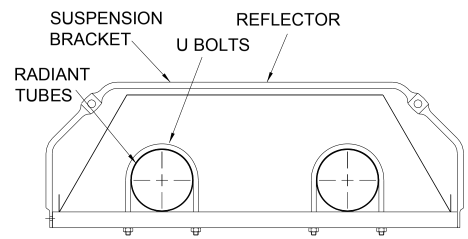
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	2 no T-4101
RADIANT TUBE 10' **MILD STEEL**	2 no T-4103
RADIANT TUBE 7' **MILD STEEL**	2 no T-4073
RADIANT TUBE 5' **MILD STEEL**	2 no T-4053
REFLECTOR 6' **ALUMINUM** *or*	6 no 202195
REFLECTOR 6' **STAINLESS STEEL**	or 6 no 1265
END CAP (SET) **ALUMINUM** *or*	1 no 3293-SUB
END CAP (SET) **STAINLESS STEEL**	or 1 no 3182-SUB
BRACKET SET	1 no BR4UTU65
TURBULATOR (FAN TUBE)	1 no 6619T
** HT COUPLER	2 no C112110
FAN	1 no 2560-1

Figure 17. Heater Assembly: Model U tube 200U75

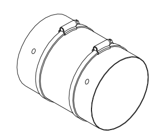




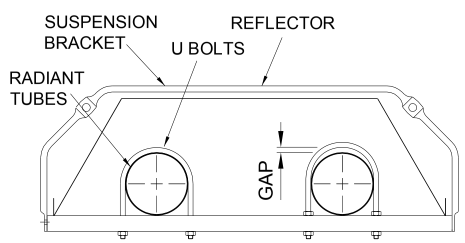
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A2) # 6579-SUB



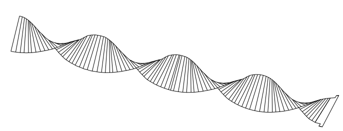
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6580-SUB



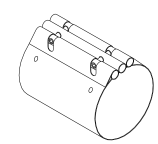
STANDARD
4" COUPLER



SUSPENSION BRACKET TYPE B
4" BURNER U BOLT. DETAIL (B2) # 6580-SUB



8'6" (2600mm) TURBULATOR DETAIL
RETURN TUBE FROM FAN END

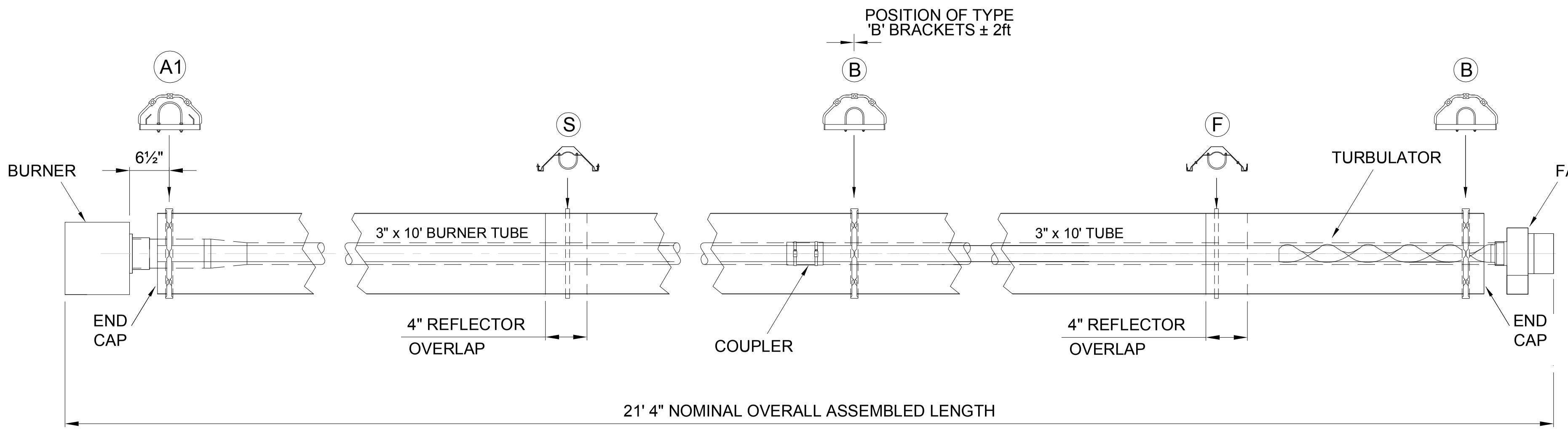


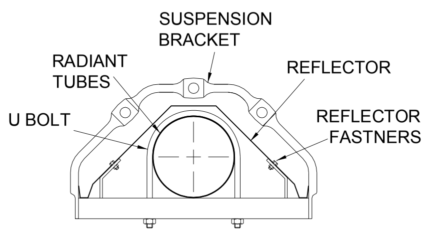
**HIGH TEMP
4" COUPLER

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

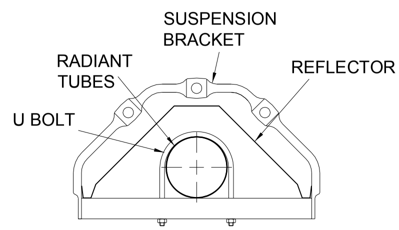
MODEL NUMBER	BTU/HR
200-U75	**200,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	2 no T-4101
RADIANT TUBE 10' **MILD STEEL**	4 no T-4103
RADIANT TUBE 7' **MILD STEEL**	2 no T-4073
REFLECTOR 6' **ALUMINUM** *or*	7 no 202195
REFLECTOR 6' **STAINLESS STEEL**	or 7 no 1265
END CAP (SET) **ALUMINUM** *or*	1 no 3293-SUB
END CAP (SET) **STAINLESS STEEL**	or 1 no 3182-SUB
BRACKET SET	1 no BR4UTU75
TURBULATOR (FAN TUBE)	1 no 6619T
** HT COUPLER	2 no C112110
FAN	1 no 2560-1

Figure 18. Heater Assembly: Model Linear 40S20 and 60S20.

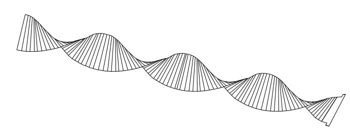




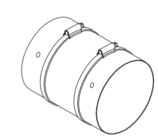
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A1) # 201851



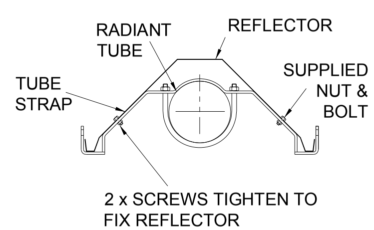
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6578-SUB



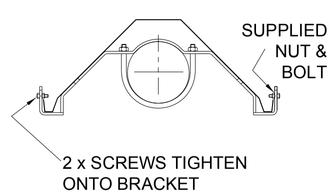
9'2" (2800mm) TURBULATOR DETAIL



STANDARD 3" COUPLER



FIXED REFLECTOR BRACKET
DETAIL (F) # 200648



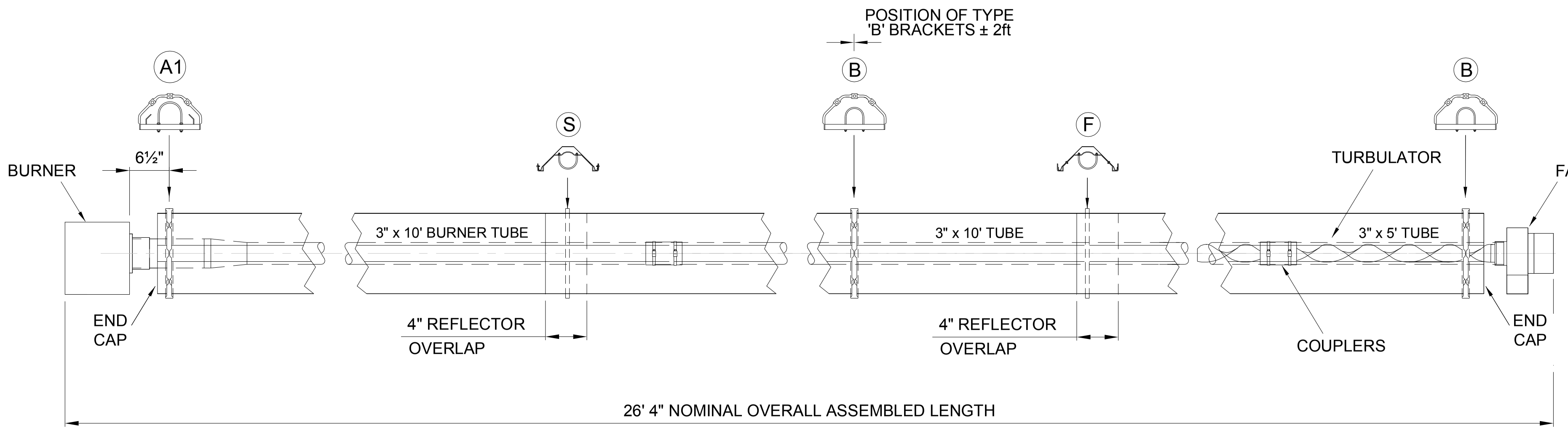
SLIDING REFLECTOR BRACKET
DETAIL (S) # 200648

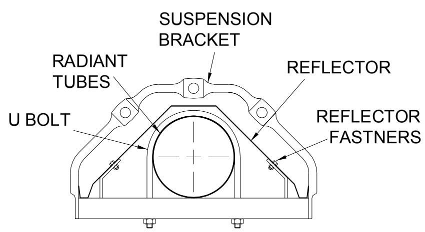
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND.

MODEL NUMBER	**BTU/HR**
40-S20	**45,720**
60-S20	**60,000**

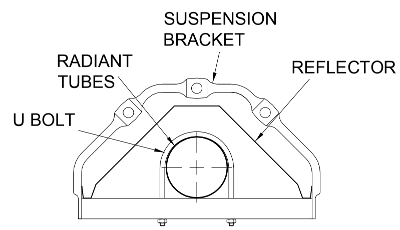
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	1 no T-3103
REFLECTOR 8' **ALUMINUM** *or*	2 no 1280-5
REFLECTOR 8' **STAINLESS STEEL**	or 2 no 1261-5
REFLECTOR 4' **ALUMINUM**	1 no 202192
REFLECTOR 4' **STAINLESS STEEL**	or 1 no 202190
END CAP PLAIN **ALUMINUM**	1 no 3291
END CAP HOLE **ALUMINUM** *or*	1 no 202200
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3191-1HMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 202197
BRACKET SET	1 no BR3SLS20
TURBULATOR	1 no 201823T
FAN	1 no 2576T

Figure 19. Heater Assembly: Model Linear 40-S25, 60-S25 and 80-S25.

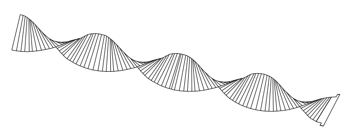




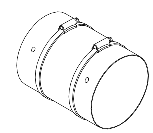
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A1) # 201851



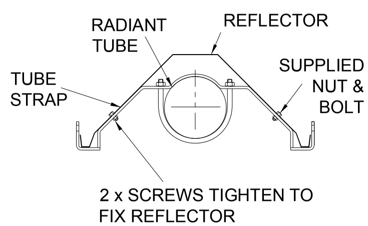
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6578-SUB



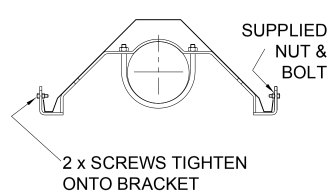
11'8" (3560mm) TURBULATOR DETAIL



STANDARD 3" COUPLER



FIXED REFLECTOR BRACKET
DETAIL (F) # 200648



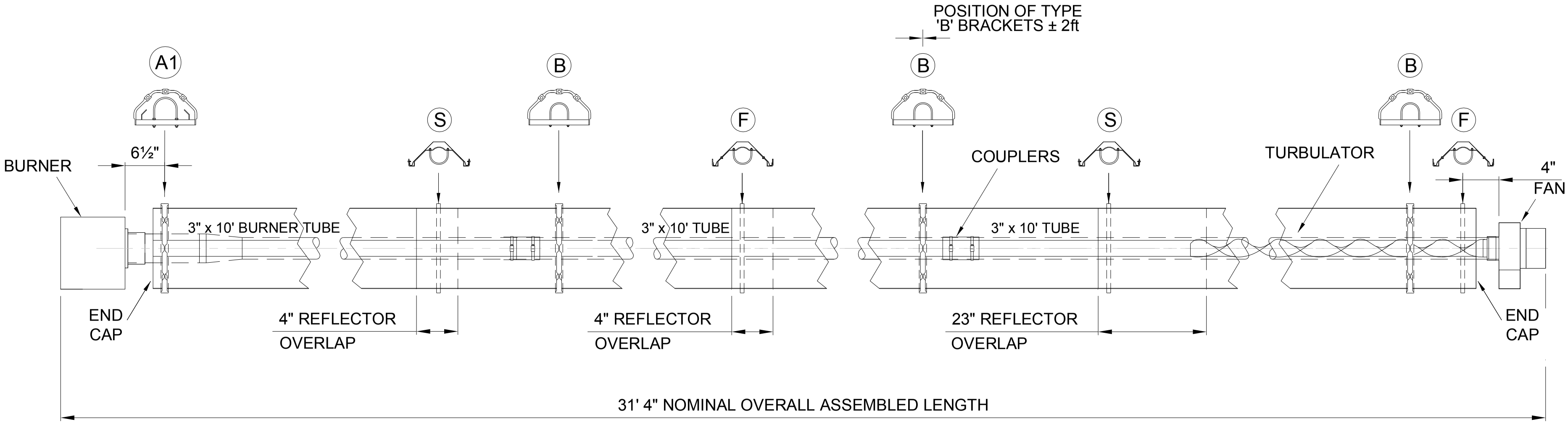
SLIDING REFLECTOR BRACKET
DETAIL (S) # 200648

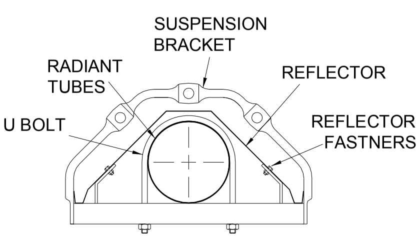
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND.

MODEL NUMBER	BTU/HR
40-S25	**45,720**
60-S25	**60,000**
80-S25	**80,000**

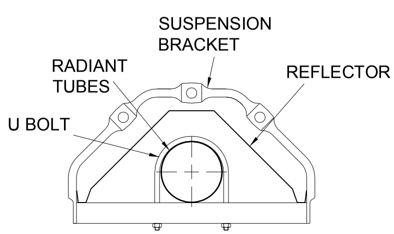
PARTS LIST	PART #
BURNER TUBE 10' **ALUMINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	1 no T-3103
RADIANT TUBE 5' **MILD STEEL**	1 no T-3154
REFLECTOR 8' **ALUMINUM** *or*	3 no 1280-5
REFLECTOR 8' **STAINLESS STEEL**	or 3 no 1261-5
END CAP PLAIN **ALUMINUM**	1 no 3291
END CAP HOLE **ALUMINUM** *or*	1 no 202200
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3191-1HMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 202197
BRACKET SET	1 no BR3SLS20
TURBULATOR	1 no 200414T
FAN	1 no 2576T

Figure 20. Heater Assembly: Model Linear 40S30, 60S30 and 80S30.

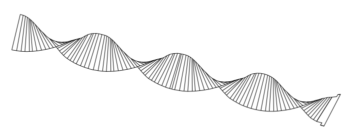




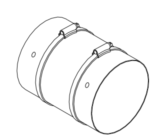
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A1) # 201851



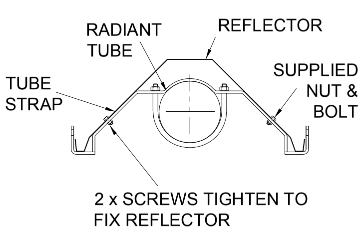
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6578-SUB



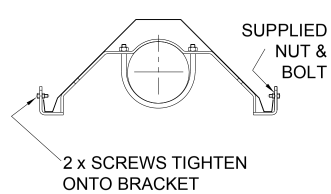
11'8" (3560mm) TURBULATOR DETAIL



STANDARD 3" COUPLER



FIXED REFLECTOR BRACKET
DETAIL (F) # 200648

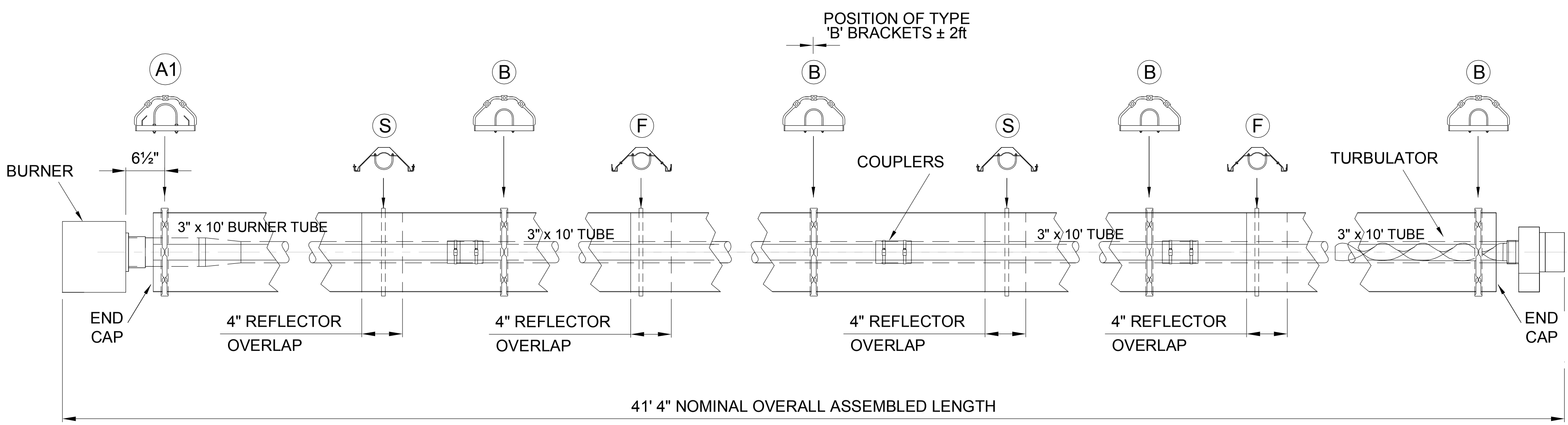


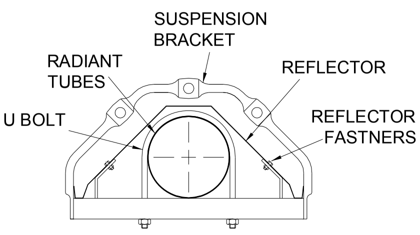
SLIDING REFLECTOR BRACKET
DETAIL (S) # 200648

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

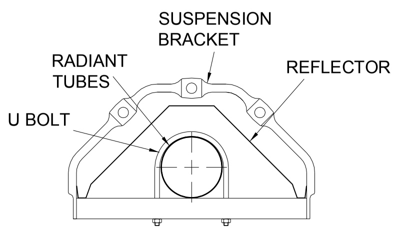
MODEL NUMBER	**BTU/HR**
40-S30	**45,720**
60-S30	**60,000**
80-S30	**80,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	2 no T-3103
REFLECTOR 8' **ALUMINUM** *or*	4 no 1280-5
REFLECTOR 8' **STAINLESS STEEL**	or 4 no 1261-5
END CAP PLAIN **ALUMINUM**	1 no 3291
END CAP HOLE **ALUMINUM** *or*	1 no 202200
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3191-1HMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 202197
BRACKET SET	1 no BR3SLS30
TURBULATOR	1 no 200414T
FAN	1 no 2576T

Figure 21. Heater Assembly: Model Linear 60-S40 and 80-S40.

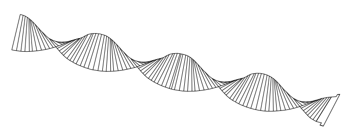




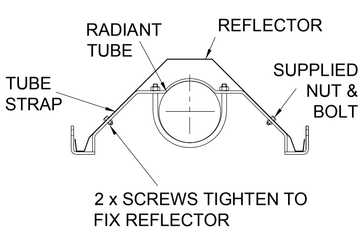
SUSPENSION BRACKET TYPE A
4" BURNER U BOLT. DETAIL (A1) # 201851



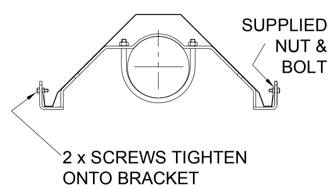
SUSPENSION BRACKET TYPE B
DETAIL (B) # 6578-SUB



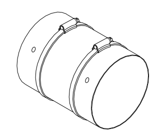
11'8" (3560mm) TURBULATOR DETAIL



FIXED REFLECTOR BRACKET
DETAIL (F) # 200648



SLIDING REFLECTOR BRACKET
DETAIL (S) # 200648



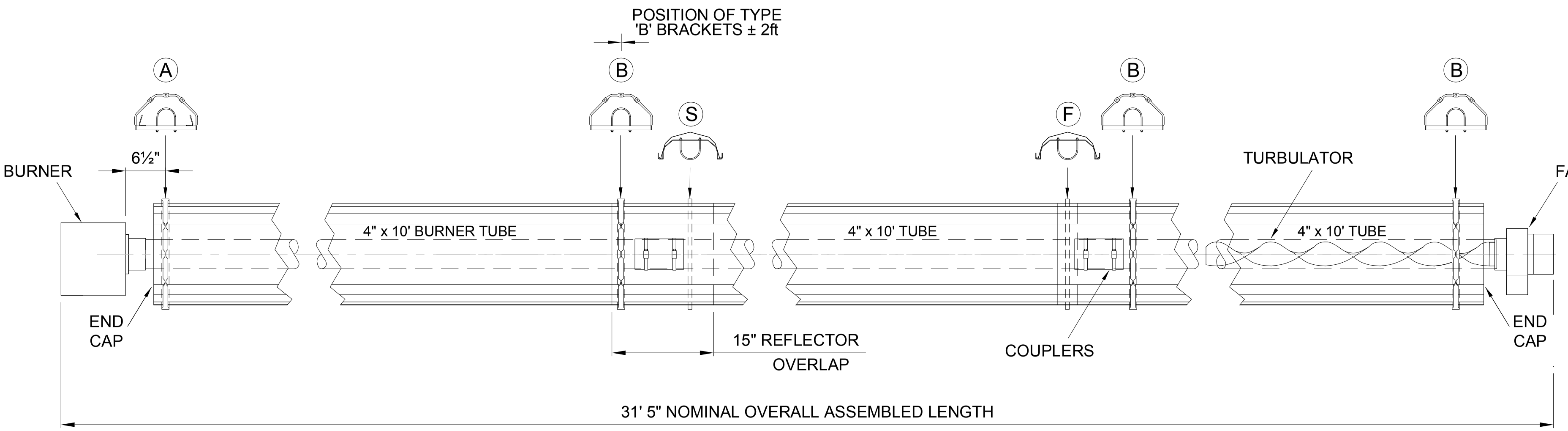
STANDARD 3" COUPLER

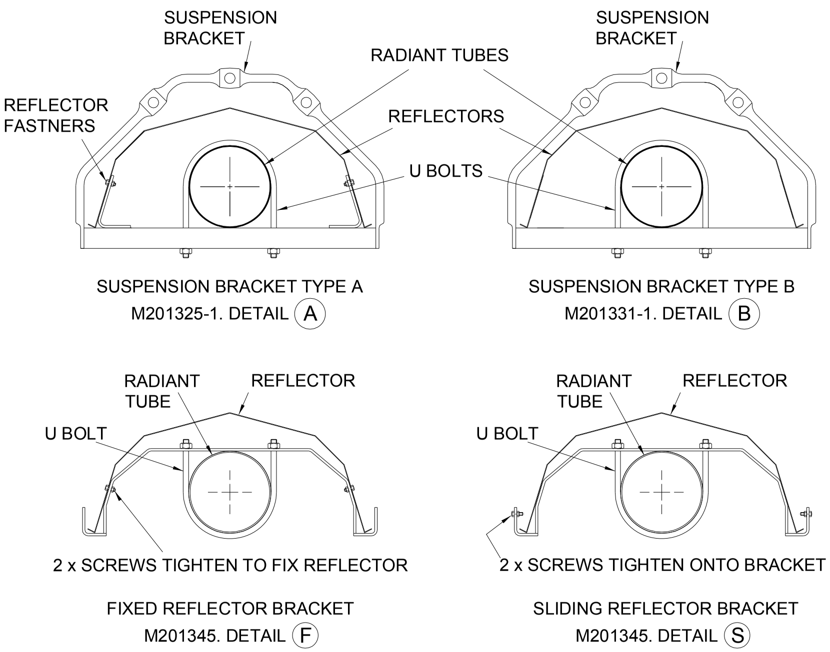
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

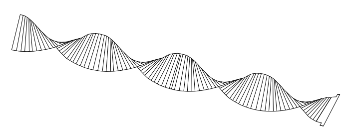
MODEL NUMBER	**BTU/HR**
60-S40	**60,000**
80-S40	**80,000**

PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no 202163
RADIANT TUBE 10' **MILD STEEL**	3 no T-3103
REFLECTOR 8' **ALUMINUM** *or*	or 5 no 1280-5
REFLECTOR 8' **STAINLESS STEEL**	5 no 1261-5
END CAP PLAIN **ALUMINUM**	1 no 3291
END CAP HOLE **ALUMINUM** *or*	1 no 202200
END CAP PLAIN **STAINLESS STEEL**	or 1 no 3191-1HMF
END CAP HOLE **STAINLESS STEEL**	or 1 no 202197
BRACKET SET	1 no BR3SLS40
TURBULATOR	1 no 200414T
FAN	1 no 2576T

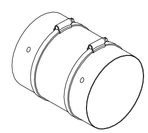
Figure 22. Heater Assembly: Model Linear 100S30.







8'6" (2600mm) TURBULATOR DETAIL

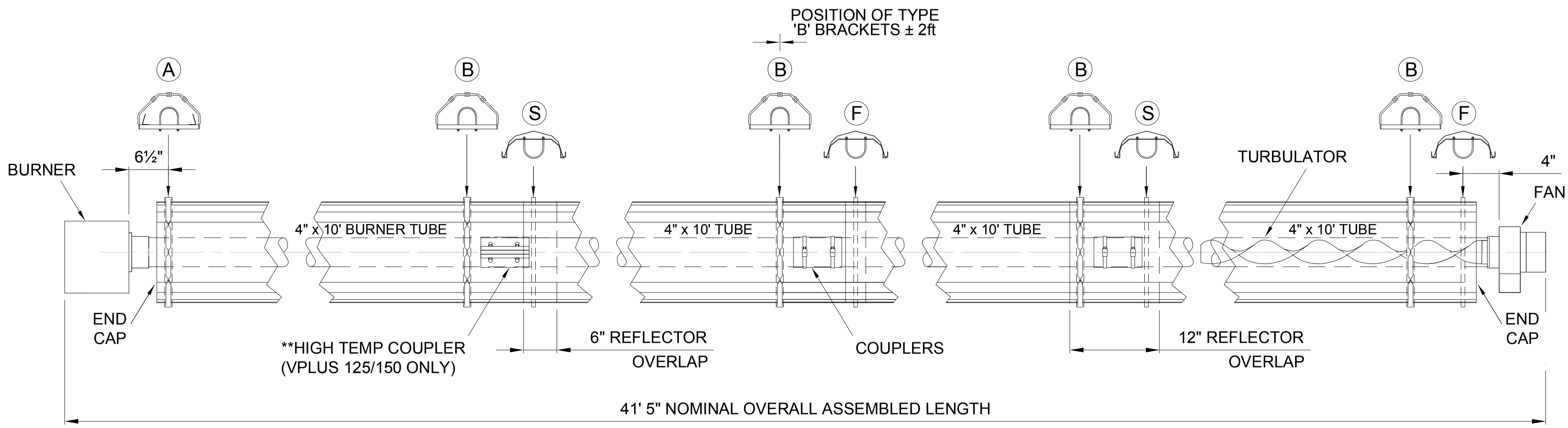


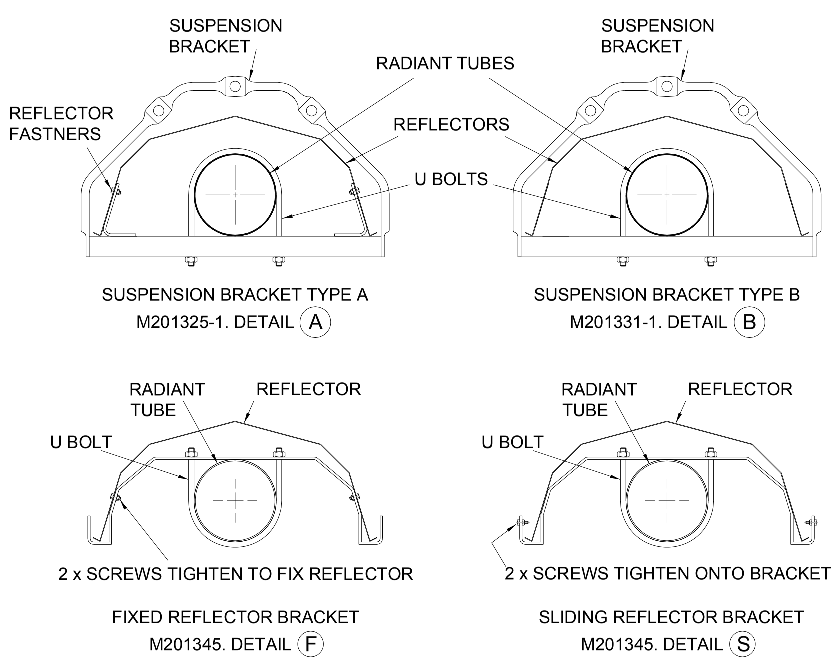
STANDARD 4" COUPLER

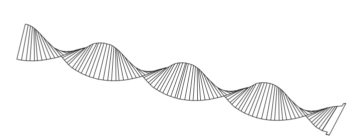
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND.

MODEL NUMBER	BTU/HR
100-S30	**100,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no T-4101
RADIANT TUBE 10' **MILD STEEL**	2 no T4103
REFLECTOR 10' **ALUMASTEEL** *or*	3 no L201032
REFLECTOR 10' **ALUMINUM** *or*	or 3 no L201031
REFLECTOR 10' **STAINLESS STEEL**	or 3 no L201030
END CAP **ALUMASTEEL** *or*	2 no L105043
END CAP **ALUMINUM** *or*	or 2 no L105041
END CAP **STAINLESS STEEL**	or 2 no L105023
BRACKET SET	1 no BR4SLS30
TURBULATOR	1 no 6619T
FAN	1 no 2576T

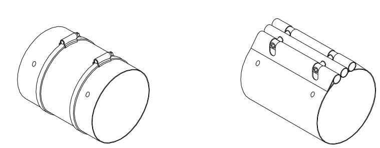
Figure 23. Heater Assembly: Model Linear 100S40, 125S40 and 150S40







8'6" (2600mm) TURBULATOR DETAIL



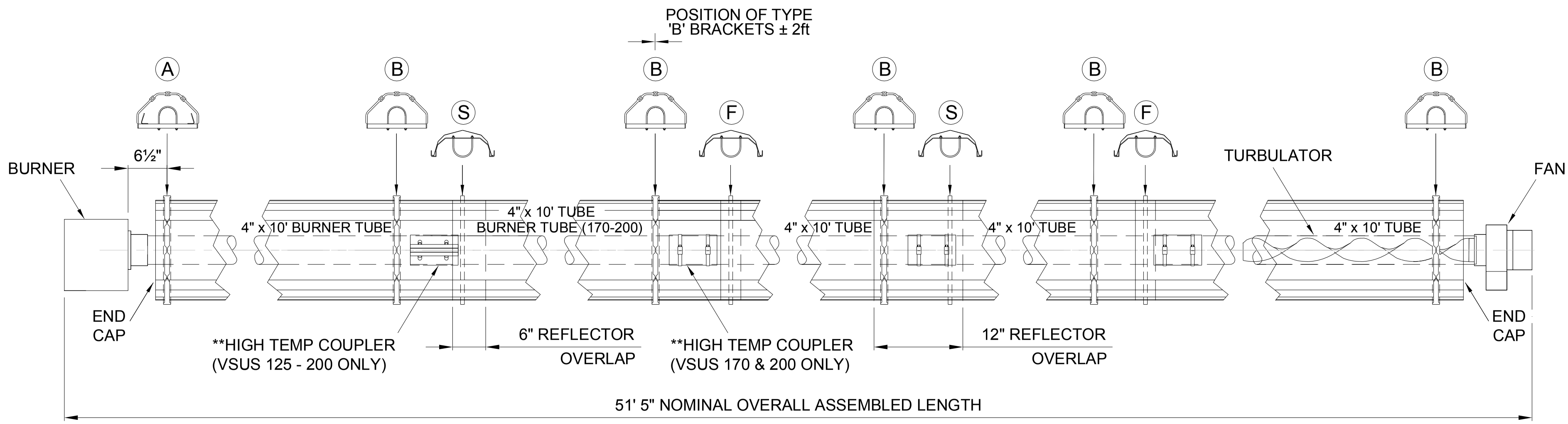
STANDARD 4" COUPLER

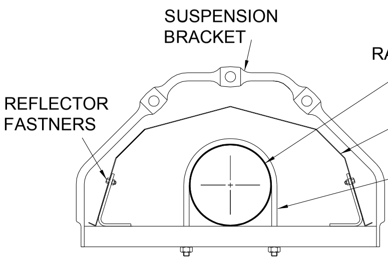
**HIGH TEMP 4" COUPLER

IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

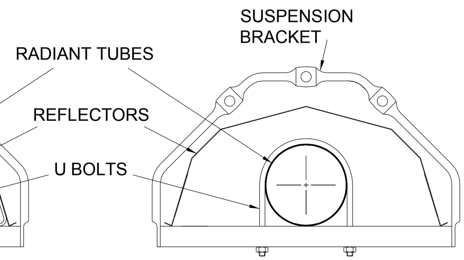
MODEL NUMBER	**BTU/HR**
100-S40	**100,000**
125-S40	**125,000**
150-S40	**150,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	1 no T-4101
RADIANT TUBE 10' **MILD STEEL**	3 no T4103
REFLECTOR 10' **ALUMASTEEL** *or*	4 no L201032
REFLECTOR 10' **ALUMINUM** *or*	or 4 no L201031
REFLECTOR 10' **STAINLESS STEEL**	or 4 no L201030
END CAP **ALUMASTEEL** *or*	2 no L105043
END CAP **ALUMINUM** *or*	or 2 no L105041
END CAP **STAINLESS STEEL**	or 2 no L105023
BRACKET SET	1 no BR4SLS40
TURBULATOR	1 no 6619T
** HT COUPLER (125/150 ONLY)	1 no C112110
FAN (100 & 125)	1 no 2576T
FAN (150 ONLY)	1 no 2560-1

Figure 24. Heater Assembly: Model Linear 100S50, 125S50, 150S50, 170S50 and 200S50

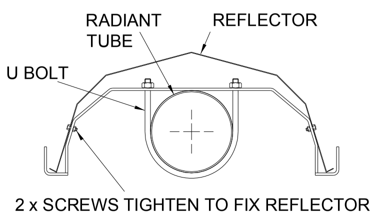




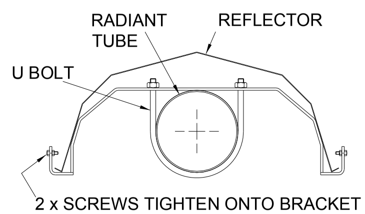
SUSPENSION BRACKET TYPE A
M201325-1. DETAIL (A)



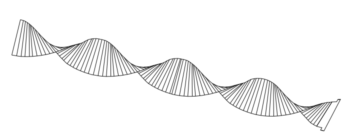
SUSPENSION BRACKET TYPE B
M201331-1. DETAIL (B)



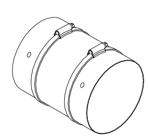
FIXED REFLECTOR BRACKET
M201345. DETAIL (F)



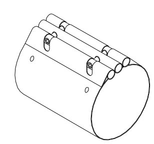
SLIDING REFLECTOR BRACKET
M201345. DETAIL (S)



8'6" (2600mm) TURBULATOR DETAIL



STANDARD 4" COUPLER



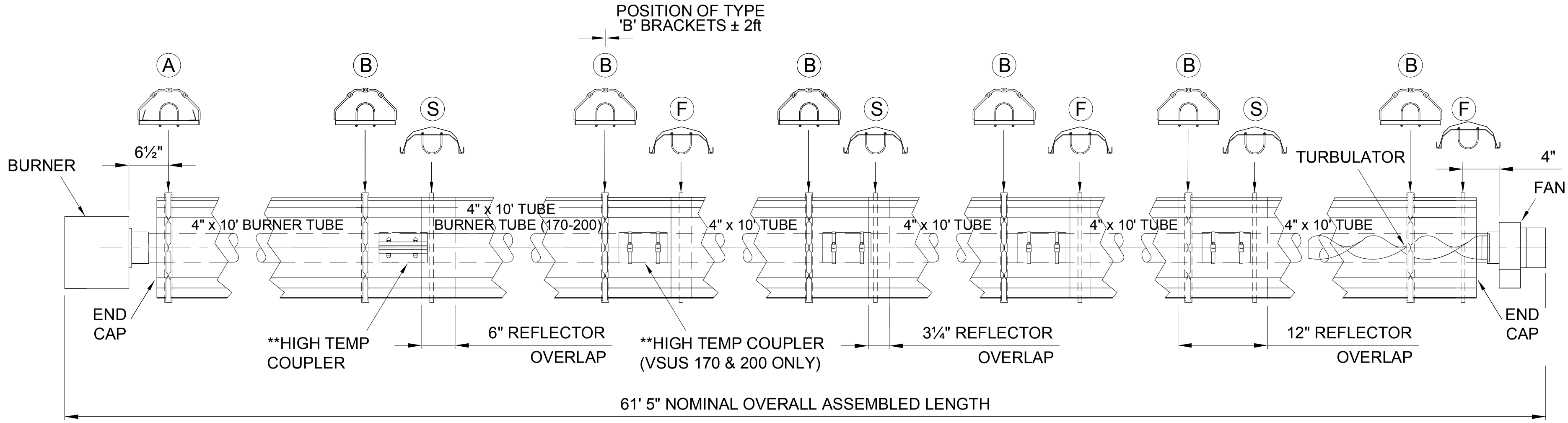
**HIGH TEMP 4" COUPLER

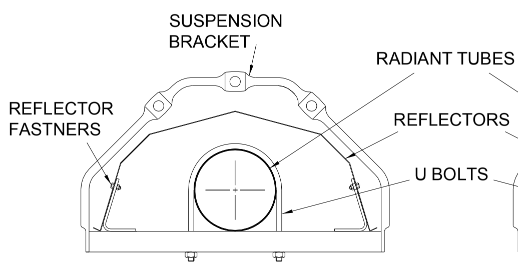
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

MODEL NUMBER	BTU/HR	TUBES	
		T-4101	T-4103
100-S50	**100,000**	1 no	4 no
125-S50	**125,000**	1 no	4 no
150-S50	**150,000**	1 no	4 no
170-S50	**175,000**	2 no	3 no
200-S50	**200,000**	2 no	3 no

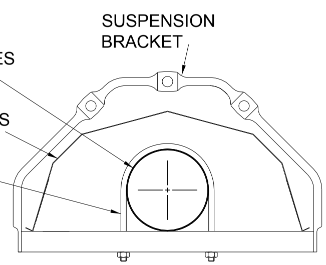
PARTS LIST	PART #
REFLECTOR 10' **ALUMASTEEL** *or*	5 no L201032
REFLECTOR 10' **ALUMINUM** *or*	or 5 no L201031
REFLECTOR 10' **STAINLESS STEEL**	or 5 no L201030
END CAP **ALUMASTEEL** *or*	2 no L105043
END CAP **ALUMINUM** *or*	or 2 no L105041
END CAP **STAINLESS STEEL**	or 2 no L105023
BRACKET SET	1 no BR4SLS50
TURBULATOR	1 no 6619T
** HT COUPLER (125 & 150)	1 no C112110
** HT COUPLER (170 & 200)	2 no C112110
FAN (100 & 125)	1 no 2576T
FAN (150, 170 & 200)	1 no 2560-1

Figure 25. Heater Assembly: Model Linear 125S60, 150S60, 170S60 and 200S60

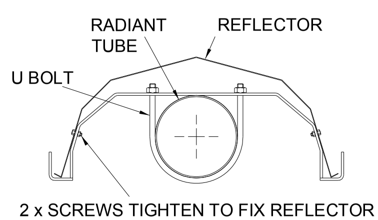




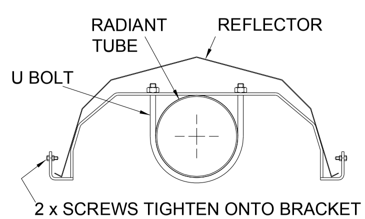
SUSPENSION BRACKET TYPE A
M201325-1. DETAIL (A)



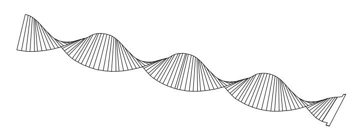
SUSPENSION BRACKET TYPE B
M201331-1. DETAIL (B)



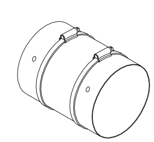
FIXED REFLECTOR BRACKET
M201345. DETAIL (F)



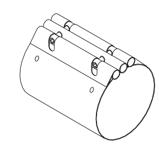
SLIDING REFLECTOR BRACKET
M201345. DETAIL (S)



8'6" (2600mm) TURBULATOR DETAIL



STANDARD
4" COUPLER



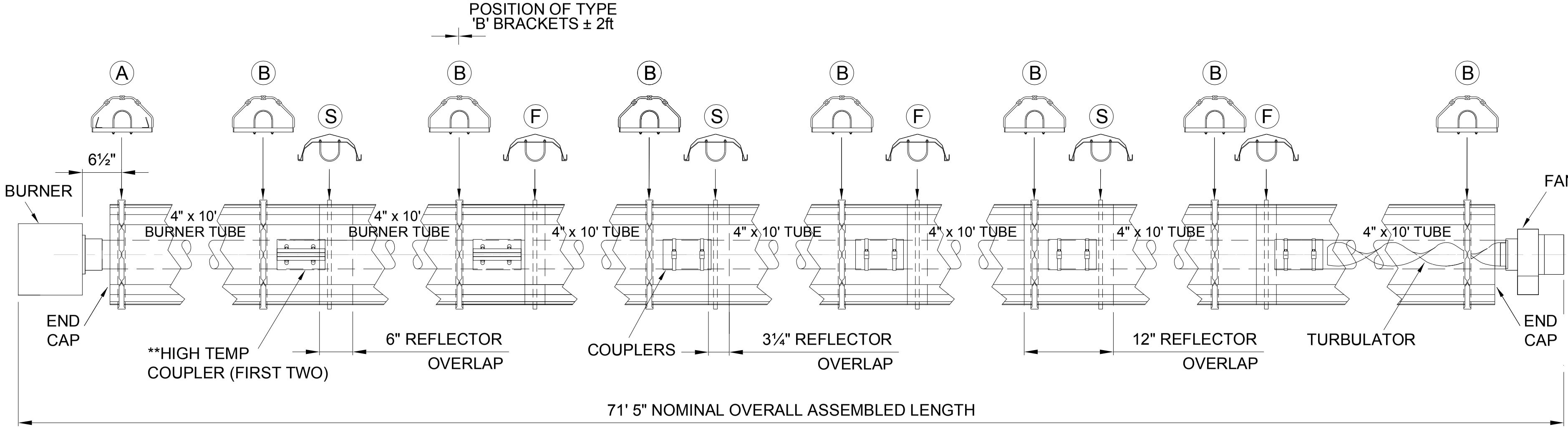
**HIGH TEMP
4" COUPLER

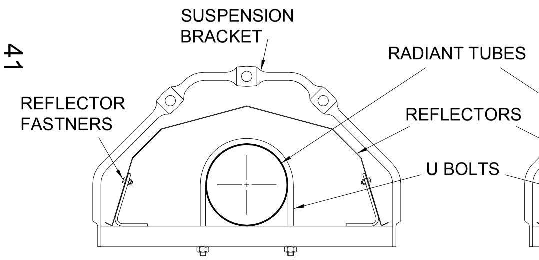
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

MODEL NUMBER	BTU/HR	TUBES	
		T-4101	T-4103
125-S60	**125,000**	1 no	5 no
150-S60	**150,000**	1 no	5 no
170-S60	**175,000**	2 no	4 no
200-S60	**200,000**	2 no	4 no

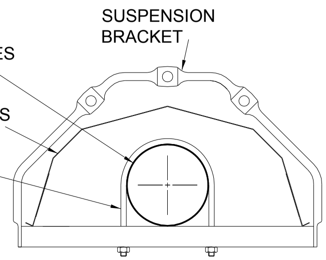
PARTS LIST	PART #
REFLECTOR 10' **ALUMASTEEL** *or*	6 no L201032
REFLECTOR 10' **ALUMINUM** *or*	or 6 no L201031
REFLECTOR 10' **STAINLESS STEEL**	or 6 no L201030
END CAP **ALUMASTEEL** *or*	2 no L105043
END CAP **ALUMINUM** *or*	or 2 no L105041
END CAP **STAINLESS STEEL**	or 2 no L105023
BRACKET SET	1 no BR4SLS60
TURBULATOR	1 no 6619T
** HT COUPLER (125 & 150)	1 no C112110
** HT COUPLER (170 & 200)	2 no C112110
FAN (125 ONLY)	1 no 2576T
FAN (150, 170 AND 200)	1 no 2560-1

Figure 26. Heater Assembly: Model Linear 170S70 and 200S70

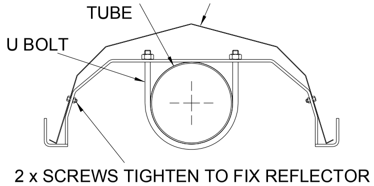




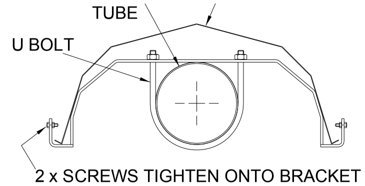
SUSPENSION BRACKET TYPE A
M201325-1. DETAIL (A)



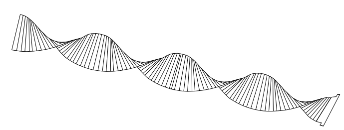
SUSPENSION BRACKET TYPE B
M201331-1. DETAIL (B)



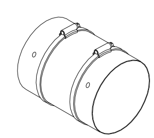
FIXED REFLECTOR BRACKET
M201345. DETAIL (F)



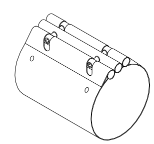
SLIDING REFLECTOR BRACKET
M201345. DETAIL (S)



8'6" (2600mm) TURBULATOR DETAIL



STANDARD
4" COUPLER



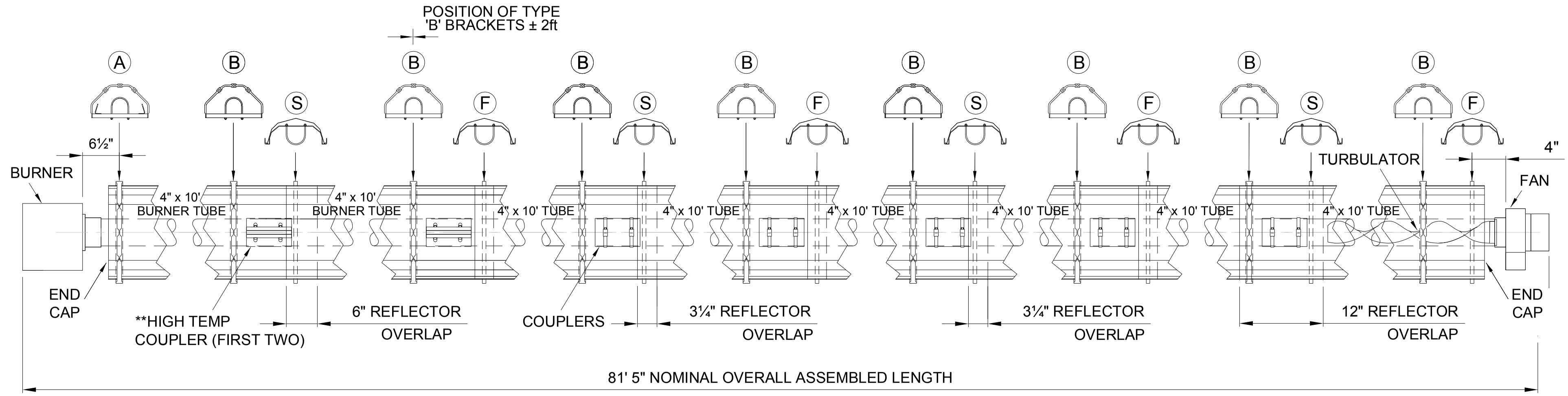
**HIGH TEMP
4" COUPLER

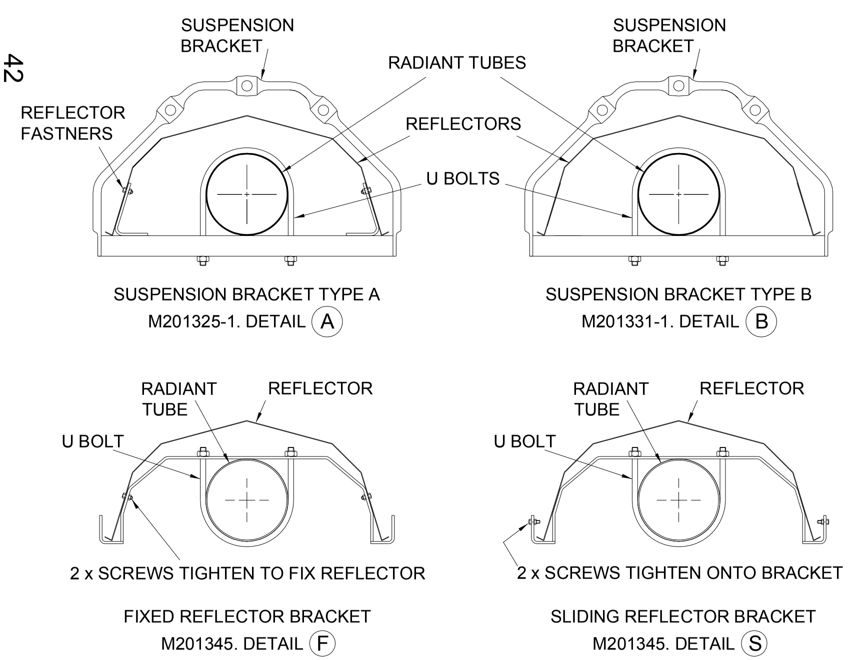
IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

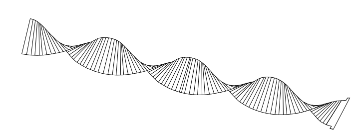
MODEL NUMBER	BTU/HR
170-S70	**175,000**
200-S70	**200,000**

PARTS LIST	PART #
BURNER TUBE 10' **ALUMINIZED**	2 no T-4101
RADIANT TUBE 10' **MILD STEEL**	5 no T4103
REFLECTOR 10' **ALUMASTEEL** *or*	7 no L201032
REFLECTOR 10' **ALUMINUM** *or*	or 7 no L201031
REFLECTOR 10' **STAINLESS STEEL**	or 7 no L201030
END CAP **ALUMASTEEL** *or*	2 no L105043
END CAP **ALUMINUM** *or*	or 2 no L105041
END CAP **STAINLESS STEEL**	or 2 no L105023
BRACKET SET	12 no BR4SLS70
TURBULATOR	1 no 6619T
** HT COUPLER	2 no C112110
FAN	1 no 2560-1

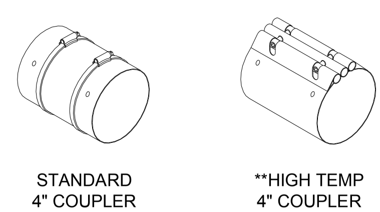
Figure 27. Heater Assembly: Model Linear 200S80







8'6" (2600mm) TURBULATOR DETAIL



IMPORTANT:
THE 2ND REFLECTOR OVERLAPS THE 1ST. THE 3RD REFLECTOR OVERLAPS THE 2ND AND SO ON TOWARDS THE FAN.

MODEL NUMBER	**BTU/HR**
200-S80	**200,000**
PARTS LIST	**PART #**
BURNER TUBE 10' **ALUMINIZED**	2 no T-4101
RADIANT TUBE 10' **MILD STEEL**	6 no T4103
REFLECTOR 10' **ALUMASTEEL** *or*	8 no L201032
REFLECTOR 10' **ALUMINUM** *or*	or 8 no L201031
REFLECTOR 10' **STAINLESS STEEL**	or 8 no L201030
*END CAP **ALUMASTEEL** *or*	2 no L105043
*END CAP **ALUMINUM** *or*	or 2 no L105041
*END CAP **STAINLESS STEEL**	or 2 no L105023
BRACKET SET	1 no BR4SLS80
TURBULATOR	1 no 6619T
** HT COUPLER	2 no C112110
FAN	1 no 2560-1

* OPTIONAL

3. Start Up Instructions.

These appliances should be commissioned by a qualified mechanical contractor.

3.1 Tools Required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.

Suitable alternative tools may be used.



Leather Faced Gloves



Phillips Screwdriver



Small Flat Head Screwdriver



Large Adjustable Wrenches for fitting Of Gas Flex.



½" Wrench



5/32" (4mm) Allen Wrench



Manometer



Multimeter

3.2 Start Up procedure

Inspect installation and ensure that it has been carried out in accordance with these instructions. Remove burner and inspect the electrode assemblies ensuring these are securely fixed and that all electrical connections securely made. Re-fit the burner ensuring that it is correctly positioned and the screws are fully tightened. Ensure that electrical and gas supplies are isolated.

The gas supply should be purged and tested for soundness in accordance with local and National Safety Codes.

Open isolating gas valve and test gas connections for soundness using soap solution.

Open the control housing door by unscrewing the securing screw. Ensure all internal components are securely fixed and that all connections are securely made.

Open the manual gas valve outside the control housing.

Switch on the electrical supply to start the heater and observe the correct start up sequence. Ensure that the settings of any time switch and thermostat are such that the heating system will be required to operate.

The fan will start to run and the 'power on' lamp will illuminate. Safe-start checks are carried out automatically. After the fan has run up to full speed and a satisfactory pressure condition has been established, the ignition sequence will commence. The spark ignition will be energized producing a spark at the ignition electrode. The gas solenoid valve will at the same time be energized and the 'burner on' lamp will illuminate. If the ignition is successful the flame is detected by the flame sensing probe and the 'burner on' lamp will remain on.

If ignition is unsuccessful the gas valve will close and the spark ignition de-energized after approximately 15 seconds. For approximately 30 seconds the fan will purge the system then re-ignition will be attempted. After 2 further failed attempts at ignition the control unit will 'lock-out', the 'power on' lamp will remain illuminated and the fan will run for 120 seconds and then stop. To reset after 'lockout' switch off the power supply to the system and wait 2 minutes. Turn the power on. If repeated 'lockout' occurs investigate the cause.

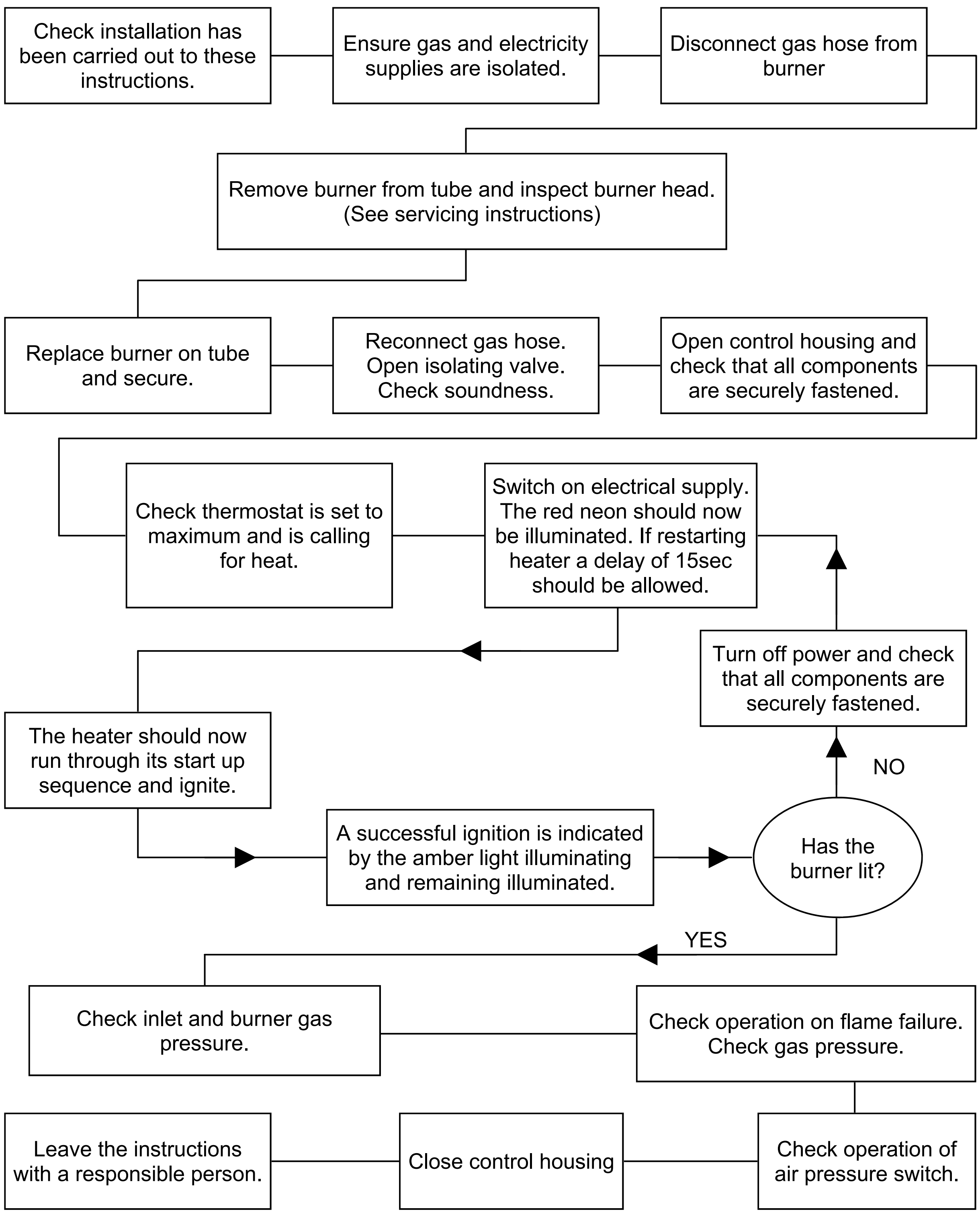
Set burner gas pressure as follows:
Switch off the power supply to the heating system. Connect a 'U' tube manometer to the pressure test point provided on the combination gas control valve. Remove the cover from the pressure regulator revealing the adjustable screw. Start the heater and using a suitable screwdriver adjust the pressure regulator, turning the screw clockwise to increase the pressure or counter-clockwise to decrease the pressure. Set the pressure to appropriate inches w.c. from the table of gas pressures for correct heater description. Switch off the power supply to the heating system. Disconnect 'U' tube manometer, then securely replace screw in pressure test nipple.

Check the operation of the flame safeguard equipment as follows:

With the heater running normally, switch off the gas supply at the shut off valve. The heater should attempt to relight and if the gas valve has been left off, 'lock-out' should occur. This is indicated by the 'power on' lamp being

illuminated and fan running, but the 'burner on' lamp being off.
Check the operation of the pressure proving switch as follows:
With the heater running normally, pull off the silicone rubber tube connecting the vacuum switch to the combustion chamber. Within 4 seconds the burner should shut off.
Replace the tube securely and observe that the heater proceeds to ignite in the normal way.
Close the controls door and secure with the screw.

Commissioning chart



4. Servicing Instructions.

These appliances should be serviced annually by a competent person to ensure safe and efficient operation. In exceptional dusty or polluted conditions more frequent servicing may be required. Servicing work should be carried out by a qualified mechanical contractor.

4.1 Tools Required.

Suitable alternative tools may be used.

The following tools and equipment are advisable to complete the tasks laid out in this manual.


Leather Faced Gloves


Phillips Screwdriver


Small Flat Head Screwdriver


Large Adjustable wrenches for fitting of Gas Flex.


½” Wrench


5/32” (4mm) Allen Wrench

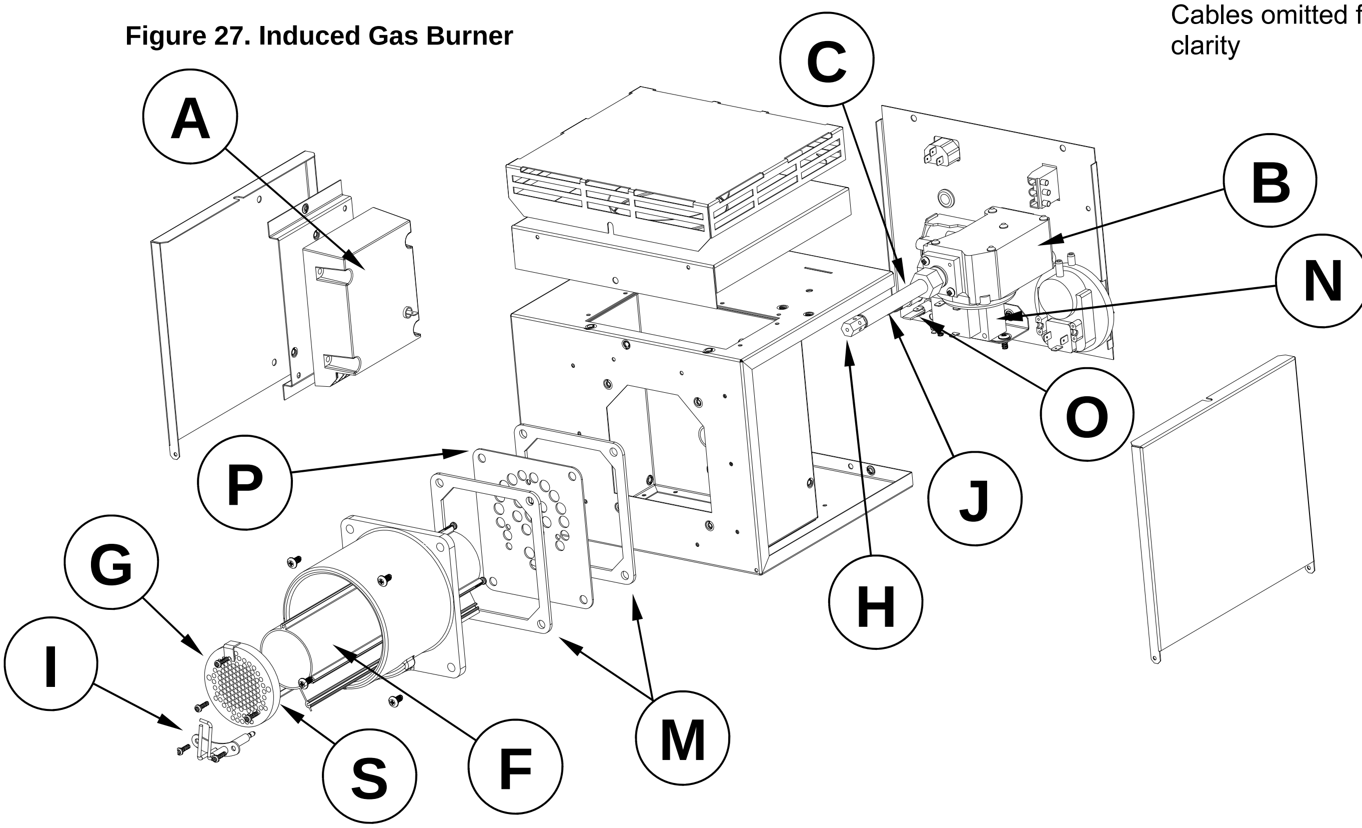

Manometer


Multimeter


Soft Brush

4.2 Burner Description.

Figure 27. Induced Gas Burner



A	Ignition Controller
B	Gas Valve
C	Power On Red Lamp
F	Burner Tube
G	Burner Head
H	Injector
I	Igniter Assembly

J	Jet Carrier
M	Gaskets
N	Transformer
O	Burner On Amber Lamp
P	Burner Orifice Plate
S	Flame Plate Location (if fitted)

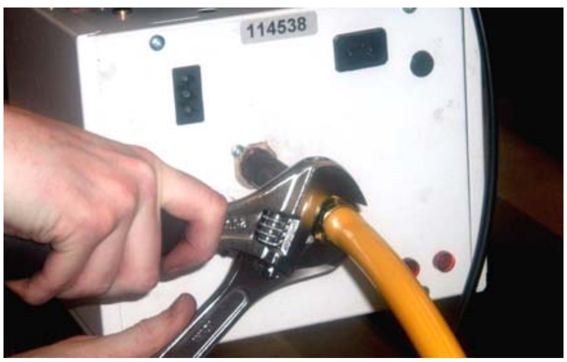
4.3 Burner Removal

Step 1: Isolate power and gas supplies.

Step 2: Unplug the power connectors.



Step 3: Detach the gas supply as shown below, taking care to support the burner connection.



Step 4: If ducted air is connected, loosen hose clamp and remove the flexible hose from the burner.

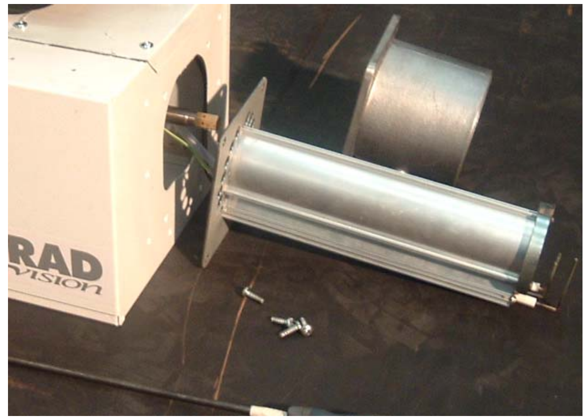
Step 5: Loosen the set screw on the burner support casting to enable the burner to be removed from the radiant tube.



Step 6: Remove the burner and position the burner in a safe area to prevent the burner or components attached to the burner from falling to the ground.

4.4 Burner Gas Injector Servicing

Step 1.a: Remove the burner support casting and gasket.



Step 1.b: The burner head assembly can be disconnected by separating the connectors of the ignition lead assembly and removing the pressure switch silicon tube.



Step 2: The gas injector can be inspected and replaced if contaminated or blocked.

When replacing the gas injector ensure approved thread sealant is used.



Step 3: Reconnect ignition leads and silicon tube to test nipple. Refit gasket and support casting.

4.5 Burner Head and Electrode Servicing

Step 1: Check the pepper pot burner head for contamination. If necessary this can be removed. See below. This can be cleaned together with the inside of the burner tube.



Step 2: The pepper pot burner head can be replaced ensuring the 5 holes on the outer ring are aligned alongside the probes.

Step 3: The condition of the igniter assembly can be checked for deterioration. However, we advise replacement at each service to ensure continued reliability.

Step 4: Detach the electrode assembly from the burner head by removing the two screws and separating the igniter lead connectors.



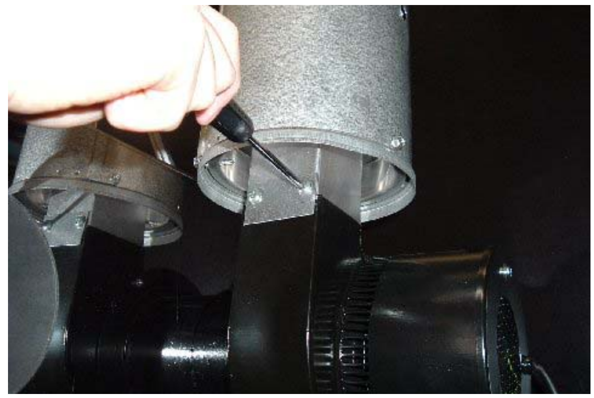
Step 5: Refit the electrode assembly and ensure the connections are secure to prevent incorrect sparking of the spark electrode.

Step 6: Check the positions and spark gap as shown below.

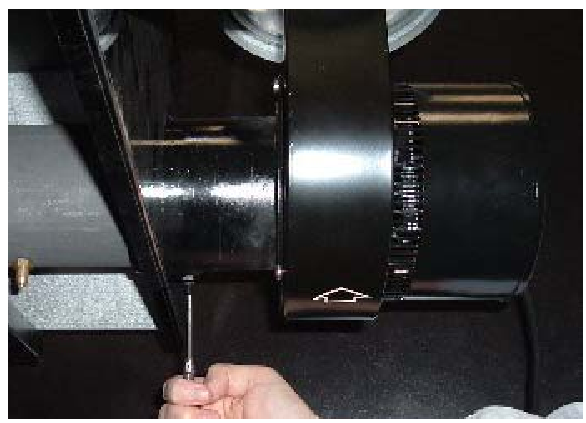
Step 7: The burner assembly is ready to refit after servicing the combustion fan and the radiant tube assembly.

4.6 Combustion Fan Assembly

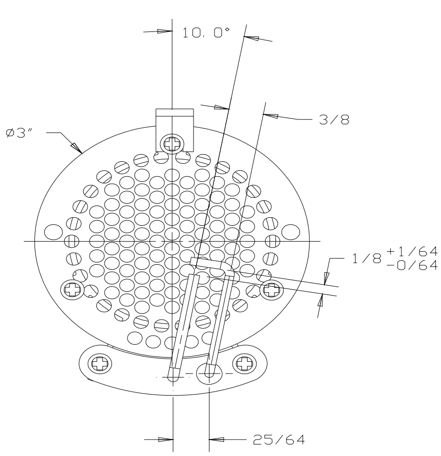
Step 1: Loosen the clamp fitting on the vent.

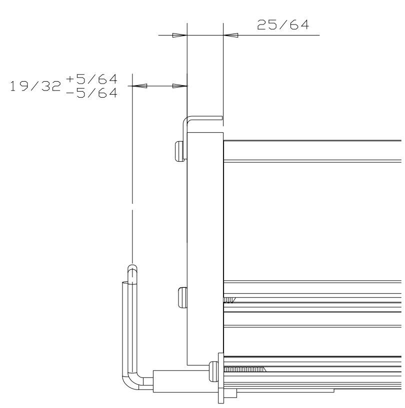


Step 2: Loosen the set screw.



Step 3: The combustion fan can now be detached.





Step 4: Remove the fan orifice plate spinning.



Step 5: Inspect the impeller and remove any dust with a soft brush.



Step 6: Remove any dust from fan scroll and from around the motor.

Step 7: Ensure the impeller rotates freely.

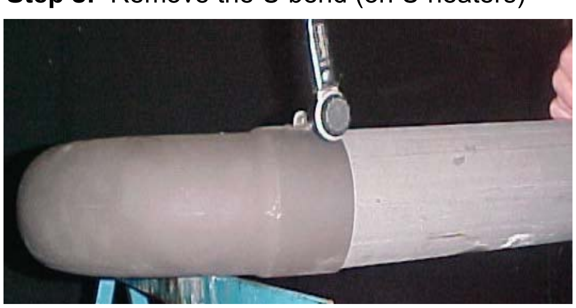
Step 8: Refit components.

4.7 Radiant Tube Servicing

Step 1: Brush any dust from the exterior of the tubes.

Step 2: Inspect the fan and burner tubes visually. If the tubes appear clean, skip to servicing the reflector.

Step 3: Remove the U bend (on U heaters)



Step 4: Withdraw the turbulators from the appliance. Carefully note their condition and position. Replace turbulators if necessary.



Step 5: The turbulators should be cleaned with a soft brush.



Step 6: If required the interior of the tubes can then be cleaned using an industrial vacuum cleaner, or by using long poles and a scraper.

Step 7: Refit components.

4.8 Reflector Servicing

The condition of the reflectors should be noted. If necessary the reflectors can be cleaned with a mild detergent. This can significantly improve the efficiency of the appliance.

4.9 Sweeping of Vent

Inspect the fresh air inlet duct and vent to ensure they are free from any blockage or obstruction. The air inlet terminal and vent terminal should be inspected to ensure they are not liable to obstruction.

4.10 Re-commissioning After Service

After servicing of the heater has been undertaken, it will be necessary to re-commission the heater as detailed in Section 3 of these instructions.

5. Spare Parts.

Required Spares

In order to aid troubleshooting and servicing we recommend that the components shown in this section should be stocked.

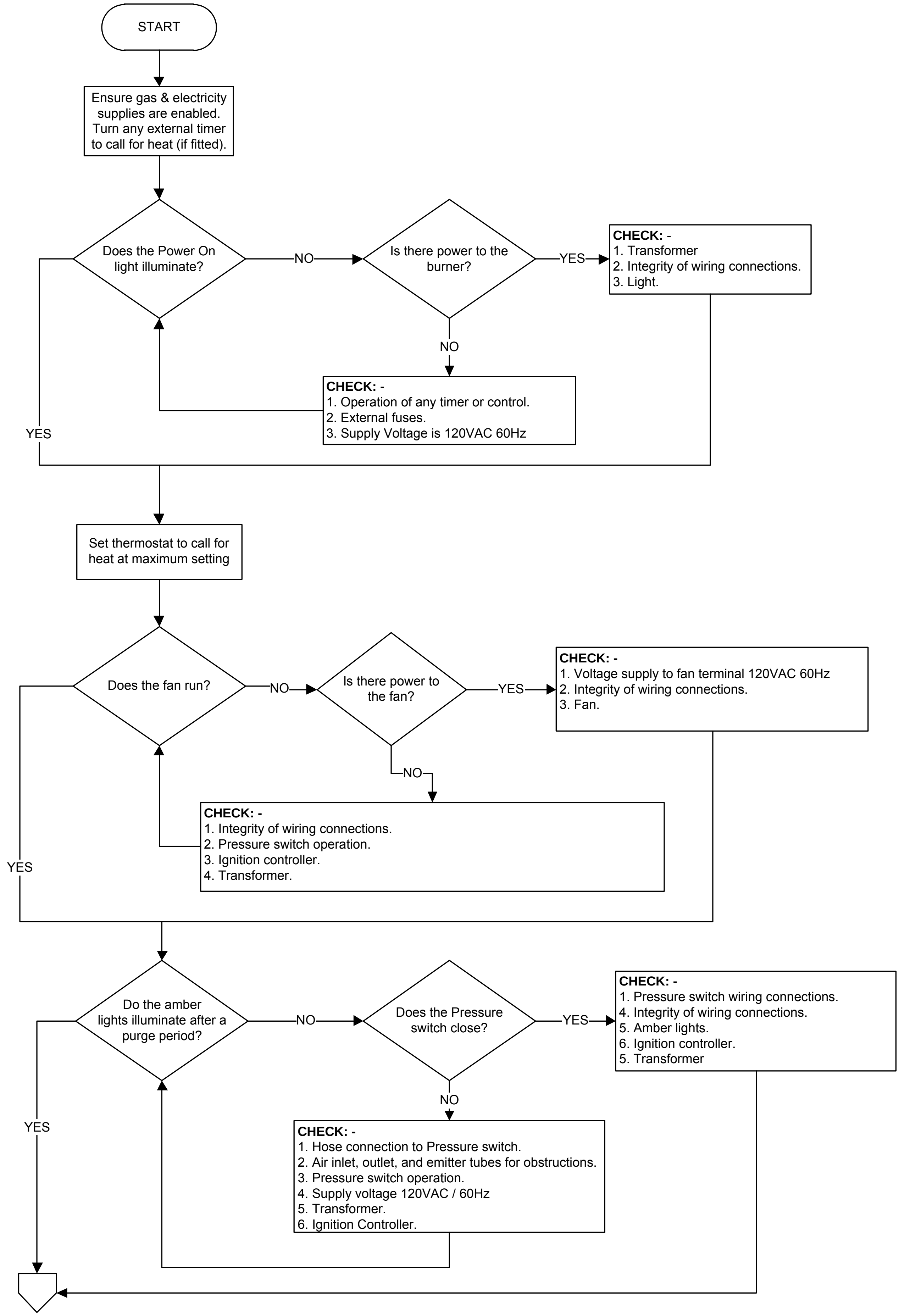
Note: Any spare part components that are not approved by the manufacturer could invalidate the approval of the appliance and the warranty.

Item	Description	Part No.
	Transformer (30VA)	900531
	Gas Valve NG	202444
	Flame Plates Models 60 / 100	201854
	Jet Carriers Models 40 - 150 NG Model 170/200 NG	202261 202262
	Burner Head	200988
	Burner Tube	200358

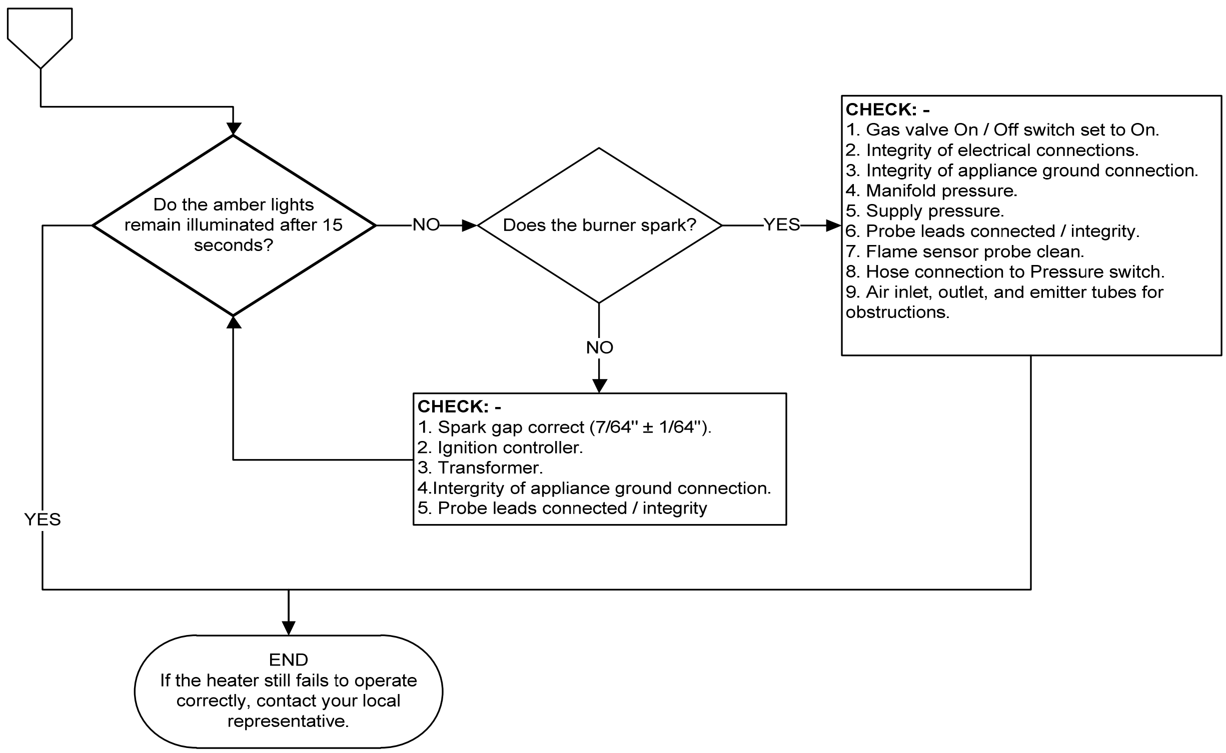
Item	Description	Part No.
	Pressure Switch	201676
	Single Probe Ignitor with Connector Lead	202531
	Amber Neon (Burner On)	2175-1
	Red Neon (Power On)	2180-1
	24V UT Ignition Controller	900545
	Injector	See section 1.8
	Combustion Fans Models 40 - 100 Models 125 - 200	2576T 2560-1

Turbulators: see individual heater assembly sheets for details (figures 10-27)

6. Troubleshooting Guide.



6. Troubleshooting Guide.



To aid the troubleshooting process, the UT controller has a LED flash code diagnostic sequence:

Steady Off No control power
Steady On Power applied, control OK
1 Flash Combustion pressure switch open with blower on
2 Flashes Combustion pressure switch closed with blower off
3 Flashes Lockout from the three ignition trials
4 Flashes Lockout from five flame losses
5 Flashes Control hardware fault detected
6 Flashes Lockout from five pressure switch losses

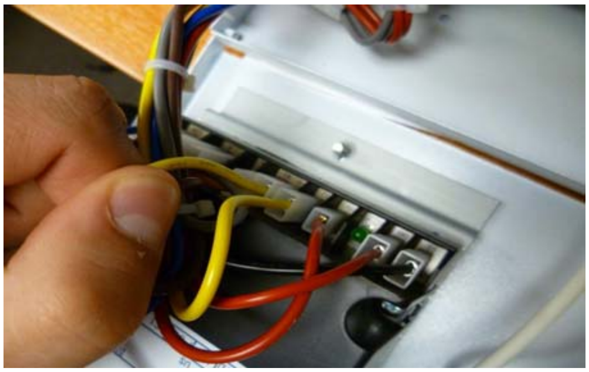
7. Replacing Parts.

Turn off gas and any electrical supplies to the heater before starting repair work.

7.1 Burner Controller Replacement

Step 1: Loosen screw in burner lid and open the right hand burner access door.

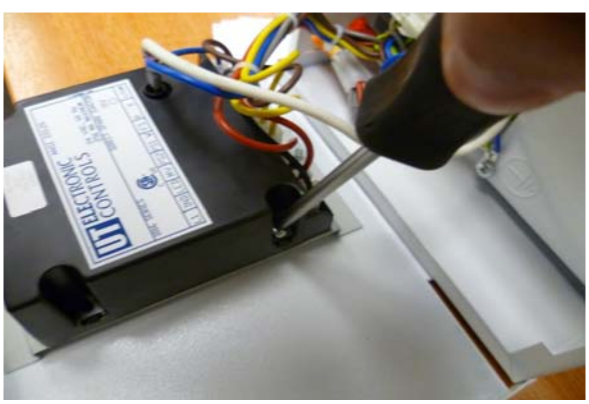
Step 2: Disconnect burner controller from the wiring harness.



Step 3: Disconnect the HT Lead from burner controller.



Step 4: Remove the two screws attaching the controller to the burner door and remove.



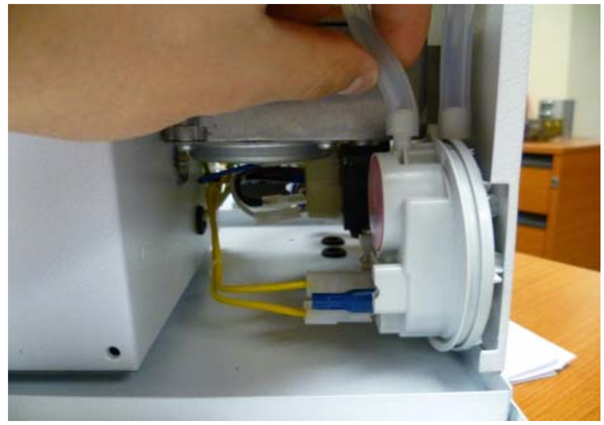
Step 5: Fit new burner controller

Step 6: Refit leads

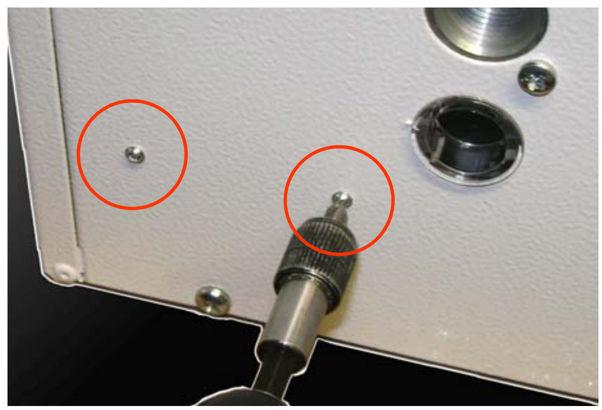
Step 7: Test product and close access door.

7.2 Air Pressure Switch Replacement

Step 1: Open left hand door. Disconnect the two silicone impulse tubes from the pressure switch.



Step 2: Remove the two retaining screws as shown below.



Step 3: Remove electrical connections. The air pressure switch can now be removed.

Step 4: Fit the new air pressure switch ensuring the impulse tubes and wire connections are connected as shown below.



Step 5: Test product and close access doors.

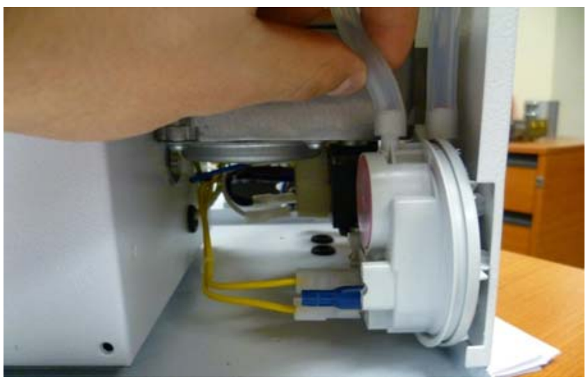
7.3 Gas Valve Replacement

Step 1: Remove the burner assembly as described in section 4 (Servicing).

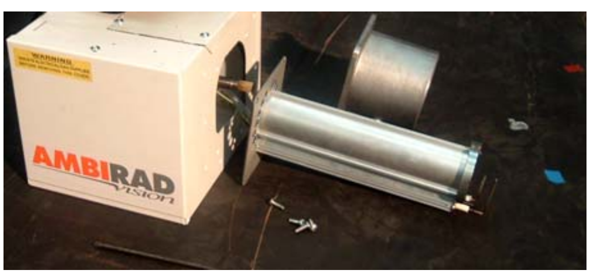
Step 2: Open the right hand access door and disconnect the burner controller from the wiring harness.



Step 3: Open the left hand access door and detach the impulse hoses from the air pressure switch.



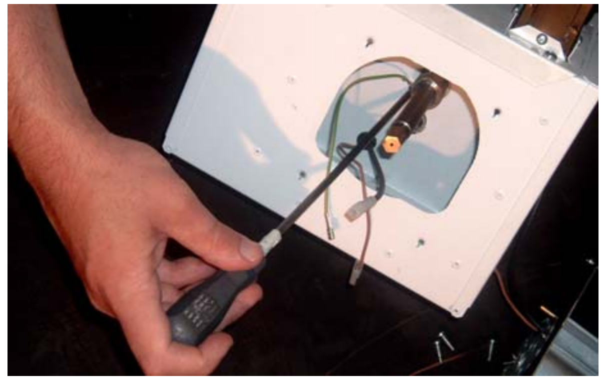
Step 4: Remove the 4 screws holding the burner head onto the burner assembly.



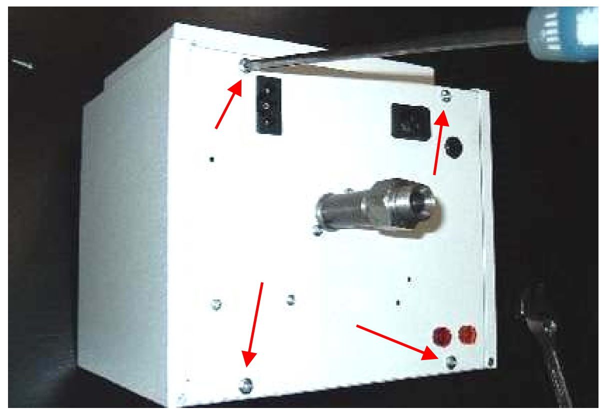
Step 5: The burner head can now be detached by disconnecting the impulse tube and the burner head wiring.



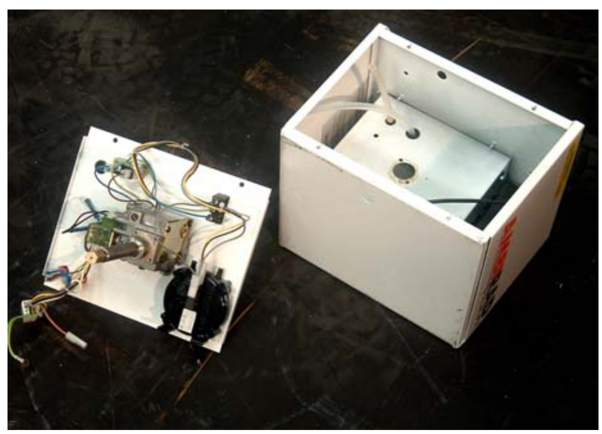
Step 6: Detach the two screws holding the front of the gas valve.



Step 7: Remove the four screws (arrowed) holding the rear burner plate in position.



Step 8: Remove the rear plate complete with gas fitting .



Step 9: The two screws retaining the gas valve can now be removed.

Step 10: The jet carrier and wiring harness can now be detached from the gas valve.

Step 11: The gas valve can now be replaced.

Step 12: Refit all components.

Step 13: Set pressures and ensure reliable burner performance.

Step 14: Test product and close access door.

8. Optional Extra Kits.

	MODEL	Natural Gas Altitude Conversion Kit	Combustion Air inlet Kit	Aluminized Steel End Cap Kit (1Pair)		Stainless Steel End Cap Kit (1 Pair)		90° Elbow Kit (1 Off)	180° U-Bend Kit
		UT & SL		UT	SL	UT	SL	4” SL ONLY	
3”	40	202255	202647	3184-1-SUB	3185-1-SUB	3184-SUB	3185-SUB	N/A	
	60	202255							
	80	202255							
4”	100	202256		3182-1-SUB	202587	3182-SUB	202588	202631	202632
	125	202257							
	150	202258							
	170	202259							
	200	202260							

9. User & Operating Instructions.

AmbiRad is the manufacturer of a series of tubular infra-red heaters designed for overhead heating of industrial and commercial buildings. Individual heating units are suspended from the roof or mounted at an angle on the wall.

1. **This appliance must only be installed by qualified craftsmen in accordance with the requirements of local and National Codes.**
2. **This appliance must be grounded in accordance with the National Electrical Code ANSI/NFPA No.70.**
3. **Never rest anything, especially ladders, against the heaters.**

9.1 To Start the Heater

1. First ensure that the gas supply to each heater is turned on by opening the main gas shut off valve.
2. Ensure that the setting of any time switch and thermostat are such that the heating system will be required to operate.
3. Switch off the electricity supply to the heater. The fan will start, the 'power on' light on the burner will illuminate and ignition commence.
4. Ignition will occur.
5. If ignition is successful the gas valve will close and the spark ignition de-energize after approximately 15 seconds. For approximately 30 seconds the fan will purge the system then re-ignition will be attempted. After 3 failed re-ignition attempts the control unit will 'lock-out', the 'power on' lamp will remain illuminated and the fan will continue to run. To reset after 'lockout', switch off the power supply to the heater and wait 5 minutes. Turn the power on. If repeated 'lockout' occurs investigate the cause.

9.2. To Switch Off the Heater

Switch off electrical supply to the heater.
The burner and the fan will shut off.

9.3. Servicing

To ensure continued, efficient and safe operation it is recommended that the heater be serviced annually by a qualified person in normal working conditions, but in exceptionally dusty or polluted conditions more frequent servicing may be needed.

Document reference number US/VS/017/0115

Ambi-Rad, P.O. Box 354
Fortville, IN 46040 USA
Telephone 317-577-0337
Facsimile 317-842-3989
Website www.ambirad.com/us

For the Distributor Nearest please call
1-888-330-4878